

Rhodora

JOURNAL OF THE
NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

REED CLARK ROLLINS, Editor-in-Chief

ALBERT FREDERICK HILL

STUART KIMBALL HARRIS

RALPH CARLETON BEAN

RICHARD ALDEN HOWARD

CARROLL EMORY WOOD, JR.

} Associate Editors

Vol. 55

April, 1953

No. 652

CONTENTS:

Braya in Colorado. <i>Reed C. Rollins</i>	109
A Floristic Study of Cook County, Northeastern Minnesota (continued). <i>Fred K. Butters and Ernst C. Abbe</i>	116
The Genus <i>Lyonia</i> in Missouri. <i>C. L. Kucera</i>	155
<i>Elymus riparius</i> in Illinois. <i>Julian A. Steyermark</i>	156

The New England Botanical Club, Inc.

8 and 10 West King St., Lancaster, Pa.

Botanical Museum, Oxford St., Cambridge 38, Mass.

RHODORA.—A monthly journal of botany, devoted primarily to the flora of the Gray's Manual Range and regions floristically related. Price, \$4.00 per year, net, postpaid, in funds payable at par in United States currency in Boston; single copies (if available) of not more than 24 pages and with 1 plate, 40 cents, numbers of more than 24 pages or with more than 1 plate mostly at higher prices (see 3rd cover-page). Back volumes can be supplied at \$4.00. Some single numbers from these volumes can be supplied only at advanced prices (see 3rd cover-page). Somewhat reduced rates for complete sets can be obtained on application to Dr. Hill. Notes and short scientific papers, relating directly or indirectly to the plants of North America, will be considered for publication to the extent that the limited space of the journal permits. Illustrations can be used only if the cost of engraver's blocks is met through the author or his institution. Forms may be closed five weeks in advance of publication. Authors (of more than two pages of print) will receive 15 copies of the issue in which their contributions appear, if they request them when returning proof. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscripts and proofs to Reed C. Rollins,

Gray Herbarium, 79 Garden Street, Cambridge 38, Mass.

Subscriptions (making *all remittances* payable to **RHODORA**) to Dr. A. F. Hill, 8 W. King St., Lancaster, Pa., or, preferably, Botanical Museum, Oxford St., Cambridge 38, Mass.

Entered as second-class matter March 9, 1929, at the post office at Lancaster, Pa., under the Act of March 3, 1879.

INTELLIGENCER PRINTING COMPANY
Specialists in Scientific and Technical Publications
EIGHT WEST KING ST., LANCASTER, PA.

**CARD-INDEX OF NEW GENERA, SPECIES AND
VARIETIES OF AMERICAN PLANTS**

For all students of American Plants the Gray Herbarium Card-index of Botanical Names is indispensable. It is a work of reference essential to scientific libraries and academies and all centers of botanical activity. It includes genera and species from 1885 to date. The subdivisions of species from 1885 to date are now included and from 1753 to 1886 are in the process of being inserted. Issued quarterly, at \$25.50 per thousand cards.

GRAY HERBARIUM of Harvard University,
Cambridge 38, Mass., U. S. A.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 55

April, 1953

No. 652

BRAYA IN COLORADO

REED C. ROLLINS

THE discovery of a population of *Braya* in the high mountains of central Colorado in 1950 by Messrs. H. D. Ripley and R. C. Barneby is not only of interest but several problems arise as a result of it. This station is nearly a thousand miles south of the nearest known locality for the genus *Braya* in Alberta.¹ The Colorado plants are closely related to a wide-ranging and polymorphic arctic and subarctic species, *B. humilis*, which has often been placed in the genus *Torularia*. Abbe (1948) retained it in *Braya*, but more recently Böcher (1950), in a thorough cyt-taxonomic study of Greenland material, chose to treat the species as a *Torularia*. To properly handle the Colorado plants, two problems need to be dealt with: (1) Are they one of the many isolated and distinctive populations of *Braya humilis*, or are they a distinct species? (2) Do they (and *B. humilis*) belong to the genus *Braya*, or should they be placed in *Torularia*? I shall attempt to answer the last question first.

Torularia would appear to have been originally founded upon *Sisymbrium* (*Braya*) *humile* (Schulz, 1922). However, one finds that Schulz, in this first published work using the name *Torularia* in generic rank, merely made a new combination without providing a generic description. The generic name *Torularia* was first validly published in *Das Pflanzenreich* (Schulz, 1924) and the genus was based on species formerly referred to subgeneric divisions in *Sisymbrium* and *Malcolmia*. *Torularia* was used as a sectional name in *Sisymbrium* by Cosson (1885) to contain the single species *S. torulosum*. Schulz raised Cosson's sectional

¹ This ignores the transfer by Jones (1929) of *Draba graminea* to *Braya*. Actually the species is unquestionably a *Draba*.

name to generic rank. From this, it follows that *Torularia torulosa* is the type species and becomes the point of reference for the generic name *Torularia*. When one considers the relationships of *Torularia*, using *T. torulosa* as a principal point of reference, it is perfectly clear that this genus as a whole is much more closely related to *Malcolmia* than it is to *Braya*. Furthermore, considerable stretching is needed to include *Braya humilis* in it. On the other hand, *B. humilis* has often been confused with *B. linearis*, which in turn was at one time included in *B. alpina*, the generic type species of *Braya*. The pattern of characteristics observable in *B. alpina* applies also in a general way to *B. linearis* and *B. humilis*. On morphological grounds, there is no sound reason for excluding *B. humilis* from the genus *Braya*. The latter is an older name than *Torularia* and takes precedence in any circumstance where the two are in direct competition.

CHROMOSOME NUMBERS IN BRAYA

Chromosome numbers so far reported for *Braya* are: *B. alpina*, $2n = 32$ (Manton, 1932); *B. linearis*, $2n = 64$ and *B. purpurascens*, $2n = 64$ (Löve and Löve, 1948); *B. linearis*, $n = 21$, $2n = 42$, and *B. humilis* (as *Torularia*) $2n = 56$ (Böcher and Larsen, 1950). A collection of *B. humilis*² from Alaska (Drury, no. 3298) has $2n = 40$. The Colorado population (Rollins, Weber, and Livingston, no. 5153) was counted from buds fixed in the field and was found to have $n = 32$. In studying fuelgen preparations of root tips of the Alaskan collection, Drury 3298, a great range in chromosome size within the complement was noted. Some of the smallest chromosomes are about the same size as one arm of a medianly constricted large chromosome. Such small chromosomes could easily be mistaken for one arm of a large chromosome or, as was most often the case, one arm of a large chromosome was mistaken for a small chromosome. The tendency was to count more rather than fewer chromosomes in figures where there was any possibility of confusion. It was only after a close study of numerous preparations that $2n = 40$ was established as a certainty for this collection.

From the above counts, polyploidy in the genus is seen to be well established. Thus one of the mechanisms having a direct

²I am indebted to Dr. L. O. Gaiser for the accompanying cytological data.

bearing on speciation and upon the expected variation within species has been demonstrated. Although it is not known whether apomixis occurs in the genus, it may not be amiss to point out that apomixis combined with polyploidy could easily account for the distinct but only slightly different populations of *B. humilis* so clearly indicated by Abbe (l. c.). All counts fit a polyploid pattern except those of $n = 21$ and $2n = 42$ for *B. linearis* made by Böcher and Larsen. In high polyploids, the loss or gain of a few chromosomes is apparently easy and may affect the morphology and physiology of a particular race very little or none at all. It would be surprising to me if some aneuploidy did not occur in a genus such as *Braya*, where polyploidy is obviously so wide spread. However, further work is needed to fully clarify this apparent discrepancy of $2n = 42$ and $2n = 64$ in the same species. The discovery of $2n = 40$ in an Alaskan population of *B. humilis* and of $n = 32$ in the Colorado population of *B. humilis*, subsp. *ventosa*, further ties this species into *Braya* and points against removing it to *Torularia*.

BRAYA HUMILIS

Three different chromosome counts from as widely separated areas as Alaska, Colorado, and Greenland, representing the extremes in the range of *B. humilis* in North America, call for an explanation. It would be ideal to obtain many more counts from intermediately situated populations to determine the overall pattern for the species, but that is at present impossible. I have turned to pollen measurements to see whether there is any correlation between pollen size and chromosome number.

The pollen of *Braya humilis* is tricolpate with the longest axis considerably exceeding the shortest. In shape, the grains are probably *perprolate*, using the terminology of Erdtman (1952). The exine is prominently reticulately pitted and in this respect the different pollen samples studied were relatively uniform. Measurements were made from the extremities on both the long and short axes, including the exine. Ten grains of each sample were measured except in one instance where two size-classes were found, where ten of each size-class were measured.

The lowest chromosome number, $2n = 40$, was found in Alaska material, *Drury*, no. 3298. Pollen of this same collection meas-

ured $32.1 \times 19.1 \mu$ (ave. of ten grains). In another Alaskan collection, *Drury*, no. 2131, filled grains averaged $30.5 \times 20.5 \mu$. In this latter collection, non-filled (and non-staining) grains measured $22.5 \times 15.1 \mu$. Nearly fifty per cent of the grains were in the latter class. Preparations showing both size-classes of grains undisturbed within the anthers were prepared in order to make certain there was no contamination involved. Unfortunately, pollen from the same collection used by Böcher (l. c.) to obtain chromosome counts was not readily available. However, *Braya humilis* is of restricted occurrence in western Greenland and the plants sampled are likely to be the same taxon as those from which chromosome counts were obtained. Pollen from a collection by M. P. and A. E. Porsild, s. n., Aug. 4, 1914, averaged $33.0 \times 19.4 \mu$. The pollen of the Colorado population averaged $36.7 \times 20.0 \mu$. Thus it is seen that there is a rough correlation between pollen size and chromosome number, the Alaskan plants with $2n = 40$ having pollen $32.1 \times 19.1 \mu$; the western Greenland plants with $2n = 56$ having pollen 33×19.4 ; and the Colorado plants with $2n = 64$ having pollen 36.7×20 . Other pollen measurements on American material were within the same general range—a collection from eastern Greenland, Sørensen 4230, referred to subsp. *arctica* by Böcher, having $31.6 \times 18.6 \mu$; a collection from Anticosti Island, Marie-Victorin and Roland Germain 27-203, having $32.2 \times 19.6 \mu$; and a collection from Fort Churchill, Gillett 2242, having $34.4 \times 21.8 \mu$. However, a collection from southwestern Kansu, J. F. Rock 12269, has pollen somewhat smaller than that of the smallest of the American collections. The grains average $26.7 \times 16.3 \mu$. Generalizations cannot safely be made on such meagre data, but there is an indication that lower chromosome numbers are to be expected in the Asiatic populations. This points to Asia as the area of origin for *Braya humilis*. As the species spread eastward through Alaska, polyploidization increased the chromosome number, so that the highest ploidy is found, so far as is known, at the greatest distances from its area of origin. Such assumptions as to the origin and spread of *B. humilis* are supported also by morphological details, there being a closer resemblance between Alaskan and Altai plants than between Altai plants and those from more remote stations in North America.

Both microcytes and giant pollen grains were found in a number of collections. The presence of unusually small or large grains is an indication of meiotic irregularity, particularly an ultimate unequal distribution of the chromosomes. These abnormalities are frequently associated with polyploidy and are most likely to occur in unbalanced polyploids, such as triploids, pentaploids, etc. Their persistence is often permitted in a given species by the presence of asexual reproduction. It is perhaps significant that in one of the Alaskan collections studied (*Drury, 2131*), there were two size-classes of pollen grains, as indicated above. The smaller unfilled grains represented nearly fifty per cent of the total. This is a strong indication of meiotic irregularity. The presence of such a high percentage of sterile grains may be taken as evidence that a high degree of fertility is not required for the survival of these particular plants. From this it may be inferred that some form of apomixis probably permits the circumvention of the usual sexual process. It is unfortunate that seeds were not available from this particular collection so that such a hypothesis could be tested.

Polyploidy coupled with apomictic reproduction would explain very neatly the genetic origin and maintenance of the divergent relatively uniform isolated populations found in *B. humilis* today. Unfortunately, we have only circumstantial evidence of apomixis being present. There is no proof at this time. On the other hand, polyploidy has been definitely shown in a comparison of populations from three widely separated areas and pollen studies indicate that an even wider range in chromosome numbers is probably present.

I am in agreement with Böcher (l. c.) that the time for preparing a comprehensive cytotaxonomic treatment of the *Braya humilis* complex has not yet arrived. Although there is room for much work on the American plants, the most serious impediment is our lack of information about the Asiatic plants belonging to this complex. After examining the specimens from Asia in the Gray Herbarium and comparing them with the plate in Ledebour's *Icones* (1830), and then checking them against Meyer's (1831) amplified description, I am not fully convinced that typical *B. humilis* occurs in North America. It has been commonly assumed that this was the case, but proof is not ob-

tainable from the limited Asiatic material at my disposal. At the present time, it is not at all certain whether we must treat *B. humilis* as a large polymorphic species with many distinctive local populations, or whether some of these may not actually represent distinct localized species.

In attempting to see what the relationships of the Colorado plants are to the various races of *B. humilis*, as described by Abbe (l. c.), it was soon evident that they do not belong to any of these six geographically localized populations. Nor do they agree in morphological details with northwestern North American material commonly placed in *B. humilis*. The nearest approach to any *Braya* is to Abbe's race 4 from Table Mountain in Newfoundland. The Colorado material falls within *B. humilis* if it is accepted as a wide-ranging polymorphic species as in Abbe's treatment. However, the plants are more distinctive than most of the races described by him. Since they about parallel the divergence found by Böcher in the north and east Greenland plants which prompted him to establish subsp. *arctica*, it seems appropriate to designate the Colorado population as a subspecies of *B. humilis*.

Braya humilis (C. A. Meyer) Robinson, subsp. ***ventosa*** subsp. nov. Herba perennis caespitosa; caulibus decumbentibus vel erectis 3–6 cm. longis; siliquis divaricatis 1.5–2 cm. longis, ca. 1 mm. latis.

Perennial, usually with an unbranched caudex; basal rosette well developed; stems several to numerous, pubescent with 2- to 3-pronged trichomes; basal leaves numerous, thickened, spatulate, entire or with a few teeth, sparsely pubescent with branched trichomes, 1–2 cm. long, 2–3 mm. wide; cauline leaves 1–3, petiolate, spatulate; inflorescence dense; infructescence much elongated, often occupying nearly the entire stem; petals white; sepals more or less persistent; pedicels stout, 1.5–3 mm. long; siliques divaricate, slightly curved, pubescent with mostly bifurcate trichomes, 1.5–2 cm. long, about 1 mm. wide; styles ca. 1 mm. long.

Type in the Gray Herbarium, collected on rocky slopes of eastern extension of North Star Mountain, 1.5 miles west of Hoosier Pass, border of Park and Summit Counties, Colorado, Aug. 7, 1951, *Reed C. Rollins and William A. Weber* 51288. Other collections seen: same location (in flower) July 7, 1951, *Reed C. Rollins, William A. Weber, and Charles Livingston* 5153 (GH); same location, July 11, 1950, *H. D. Ripley and R. C. Barneby* 10393 (GH).

Subspecies *ventosa* is definitely perennial with a well-developed taproot. The outer stems are prostrate or decumbent but the inner are mostly erect. Nearly the entire stem is occupied by

the elongated infructescence, the lower pedicels being subtended by leaf-like bracts. The sepals are quite persistent, remaining attached in many instances where the silique is fully mature. In this latter respect, subsp. *ventosa* is closer to *B. linearis* than it is to *B. humilis*.

The Colorado population was studied on two occasions in the summer of 1951. Both times I was accompanied in the field by Dr. William A. Weber of the University of Colorado and, on the first trip, also by Mr. Charles Livingston. On the first visit, we had great difficulty finding the population because of the small size of the plants and their tendency to grow nearly concealed by rocks or other plants. Had we not been given the most precise directions as to the exact location by Mr. Barneby, I am sure we would not have found it. The plants grow on a fairly steep rocky slope with a rather sparse covering of other tundra species. It is possible, of course, that other stations for *B. humilis*, subsp. *ventosa* will be discovered but it must be extremely localized in its occurrence or it would surely have been collected earlier.

In order to bring the nomenclature into conformity with our conclusions as to the generic disposition of *B. humilis*, the following new combination is required:

B. humilis (C. A. Meyer) Robinson, subsp. ***arctica*** (Böcher) comb. nov.
Based upon *Torularia humilis*, subsp. *arctica* Böcher. Medd. om Grönl. Bd. 147. no. 7, p. 29.

LITERATURE CITED

- ABBE, ERNST C. 1948. *Braya* in Boreal Eastern America. RHODORA 50: 1-15.
- BOCHER, TYGE W. 1950. The *Carex capitata*-, the *Luzula multiflora*-, and the *Torularia humilis*-complexes. Medd. om Grönl. Bd. 147. no 7, 1-39.
- _____, and Kai Larsen. 1950. Chromosome Numbers of Some Arctic or Boreal Flowering Plants. Ibid. no. 6, 21.
- COSSON, E. 1885. Compend. Fl. Atl. II. 136.
- ERDTMAN, G. 1952. Pollen Morphology and Plant Taxonomy. 1-539. Stockholm.
- JONES, M. E. 1929. Contributions to Western Botany, no. 15, p. 68.
- LEDEBOUR, C. F. 1830. Ic. Pl. Fl. Ross. Cent. II. 16. plate 147.
- LÖVE, ASKELL AND DORIS LÖVE. 1948. Chromosome Numbers of Northern Plant Species. Rep. Univ. Inst. Appl. Sci. No. 3, Iceland, 61.

- MANTON, IRENE. 1932. Introduction to the General Cytology of the Cruciferae. Journ. Bot. XLVII. 517 and 545.
- MEYER, C. A. 1831. In Ledebour, Fl. Altaica. Vol. 3, 137-139.
- SCHULZ, O. E. 1922. In W. Limpricht, Botanische Reisen in den Hochgebirgen Chinas und Ost-Tibets. Fedde Rep. Spec. Nov. Beihefte Bd. 12: 390.
- . 1924. Cruciferae-Sisymbrieae. Das Pflanzenreich IV. 105: 213-266.

A FLORISTIC STUDY OF COOK COUNTY, NORTHEASTERN MINNESOTA

FRED K. BUTTERS AND ERNST C. ABBE

(Continued)

TYPHACEAE

- TYPHA LATIFOLIA L. Seagull Lake, BA 941; Swamp (?) Lake, "L.W.K." 1; Schroeder, BA 1085.—Shallow pools and ditches; very local.

SPARGANIACEAE

- SPARGANIUM AMERICANUM Nutt. Sawbill Creek, Bg 117; Loon Lake, BR 6517; Pope Lake, L. W. Krefting 10; Cascade River, C. B. Reif A19.—Streams; locally abundant.

- S. CHLOROCARPUM Rydb. Royal River, BsH 258.—Sluggish stream.
- S. CHLOROCARPUM, var. ACAULE (Beeby) Fernald, RHODORA 24: 29. Cross River, BR 6377.—In mud at edge of river.

- S. ANGUSTIFOLIUM Michx. Partridge Lake, BA 792; "Bearskin Lake," U. S. F. S. (Aug. 28, 1935).

- S. FLUCTUANS (Morong) Robins. Sawbill Lake, Bg 118; Rove Lake, BBsH 105.—Locally abundant; BBsH 105 was growing in 5 ft. of water in a small pond.

- S. MINIMUM (Hartm.) Fries. Grand Portage, BA 967.—Shallow pools at edge of cedar swamp.

ZOSTERACEAE

- POTAMOGETON ROBBINSII Oakes. Northern Lights Lake, U. S. F. S. 43.

- P. ZOSTERIFORMIS Fernald, Mem. Gray Herb., III, p. 36, 1932. Devil's Track River, U. S. F. S. 34; "Superior Forest," "A. H." (no date, s. n.).

- P. FOLIOSUS Raf., var. MACELLUS Fern. "Bearskin Lake," U. S. F. S. (Aug. 28, 1935).

- P. BERCHTOLDI Fieber (typical). Seagull River, BA 901; East Pope Lake, "L. W. K." 13; Birch Lake, BA 805b.

- P. SPIRILLUS Tuckerm. Cross River, BR 6373; Birch Lake, BA 805.

- P. EPIHYDRUS Raf., var. TYPICUS Fernald, Mem. Gray Herb. III, p. 114. 1932. Swamp Lake, "L. W. K." 6; Devil's Track Lake, U. S. F. S. 36.—The submersed leaves are somewhat under 0.5 cm. in width, but the plants otherwise correspond to var. *typicus*.

P. EPIHYDRUS Raf., var. *NUTTALLII* (C. & S.) Fernald. Poplar Lake, BA 837; Rose Lake, MacMillan Brand & Lyon 203; Leo Lake, BR 6339; Pike Lake, U. S. F. S. (Jul. 13, 1937).

P. AMPLIFOLIUS Tuckerm. Sea Gull River, N 1685; Sawbill Lake, Bg 116; North Lake, MacMillan Brand & Lyon 209; Royal Lake, BsH 307; Devil's Track Lake, "U. S. F. S." 17.

P. NODOSUS Poir. cf. Ogden, *RHODORA* 45: 123. Pigeon River, AA 588.

P. GRAMINEUS L., var. *gramineus*. cf. *RHODORA* 45: 143. 1943. Seagull Lake, BA 939; Round Lake, Reif A4; Cross River, BR 6385; Swamp Lake, L. W. Krefting 11; South Fowl Lake, L. S. Cheney (July 10, 1891); Royal River, BsH 306; Temperance River, Reif A1.

P. GRAMINEUS, var. *MAXIMUS* Morong ex Bennett. Poplar Lake, BA 836; John Lake, BM 10779; Brule River, BR 4638, C. B. Reif (July 10, 1936).

P. NATANS L. Granite River, L. S. Cheney (July 1, 1891); East Pope Lake, "L. W. K." 18; North Lake, MacMillan Brand & Lyon 210; Cucumber Lake, "L. W. K." (July 1936); Christine Lake, L. W. Krefting 18 (7/7/37).

P. PRAELONGUS Wulfen. Birch Lake, BA 808; Loon Lake, Reif A28; Thunder Bay Dist., Ont. (South Fowl Lake), BABs 708.

P. RICHARDSONII (Benn.) Rydb. Hungry Jack Lake, BR 6345; Northern Lights Lake, U. S. F. S. 41; Mountain Lake, BAA 328c.

NAJADACEAE

NAJAS FLEXILIS (Willd.) Rostk. & Schmidt. Birch Lake, BA 804; Caribou Lake, L. W. Krefting (July 29, 1936).—The common species in the state.

N. GRACILLIMA (A. Br.) Magnus. Caribou Lake, L. W. Krefting (July 29, 1936).—Pretty well confined to soft water ponds and lakes; known from only two other localities in the state, Ramsey Co. and Itasca Park.

JUNCAGINACEAE

TRIGLOCHIN PALUSTRIS L. Grand Portage, R. M. Schuster A5309.—"At open, mucky edge of marl bog."

SCHEUCHZERIA PALUSTRIS L., var. *AMERICANA* Fernald. Sawbill Lake, Bg 13.—Small pond, infrequent.

ALISMATACEAE

ALISMA TRIVIALE Pursh. *A. Plantago-aquatica* L., var. *brevipes* (Greene) Samuelsson ex Marie-Victorin, Fl. Laur., p. 615 (1935). Sea Gull River, N 1679; Schroeder, BA 1065.—Infrequent.

We do not find a publication by Samuelsson himself of the combination cited above as a synonym. The combination is used by Marie-Victorin (*loc. cit.*) in 1935 and by Deam (Fl. Indiana, p. 87) in 1940, both of whom attribute it to Samuelsson. In 1931 Samuelsson made the combination

"*A. Plantago-aquatica* L. ssp. *brevipes* (Greene) Sam. n. comb." (Ark. Bot. 24A, no. 7, p. 19), but does not refer in his synonymy or text to having treated it previously as a variety. There is in the Herbarium of the University of Minnesota a specimen (N. C. Fassett 4139) distributed from the Herbarium of the University of Wisconsin labelled "*Alisma Plantago-aquatica* L., var. *brevipes* (Greene) Samuelsson Det. Samuelsson." It may well be that Samuelsson originally conceived of *A. brevipes* Greene as worthy only of varietal status and so labelled his material prior to publication, and subsequently changed his mind. The varietal combination then would be simply an herbarium name.

SAGITTARIA LATIFOLIA Willd. Alton Lake, Bg 115; East Pope Lake, "L. W. K." (July 1936).

S. LATIFOLIA, f. GRACILIS (Pursh) Robinson, RHODORA 10: 31. Seagull River, BA 902; Kelso River, Bg 114; Loon Lake, BR 6519; Hungry Jack Lake, BR 6357.—Shores of ponds and in shallow streams.

S. CUNEATA Sheldon. Kelso River, Bg 113; Poplar Lake, BA 840; Pike Lake, U. S. F. S. (July 13, 1937).

HYDROCHARITACEAE

ELODEA CANADENSIS Michx. *Anacharis canadensis* (Michx.) Planch. Clearwater Lake, BA 943.—In 3 ft. of water, muddy bottom, infrequent.

GRAMINEAE

BROMUS CILIATUS L., var. CILIATUS. cf. Fernald, RHODORA 32: 70. West Pike Lake, BsH 204; Lima Mountain, BA 870; Grand Portage, Be 561, Be 475, R 7901.—Open tops of cliffs and dry hills, edge of woods, turf along sandy beach; general but not abundant.

B. DUDLEYI Fernald, RHODORA 32: 70. Lima Mountain, BA 891.—Trailsides.

B. INERMIS Leyss. Brule River, BR 4637.—Sandy opening near river mouth; introduced.

SCHIZACHNE PURPURASCENS (Torr.) Swallen, Jour. Wash. Acad. Sci. 18: 204. *Melica striata* (Michx.) Hitchc. South Lake, BA 781; Poplar Lake, D 45; Rove Lake, BBsH 98; Mountain Lake, BAA 269; North Fowl Lake, BABs 706; Mount Josephine, NE 2055; Tofte, BR 4465.—Woods, cliffs, and clearings; general and fairly frequent.

FESTUCA SAXIMONTANA Rydb. cf. Fernald, RHODORA 37: 251. South Fowl Lake, BM 10823; Pigeon Point, BAA 390, BAA 419; Lucille Island, BAA 367; Grand Portage, F. F. Wood 21; Mount Josephine, BA 185; Grand Marais, BR 4652 & 4653, BM 10767 & 10772.—Generally distributed along the shore of Lake Superior and throughout the northern part of the state.

The plants from the Point at Grand Marais approach *F. brachyphylla* Schult. (cf. Fernald, loc. cit., p. 251; Abbe, RHODORA 38: 142) but the anthers are not yet mature (in BM 10772 they are 0.9–1.2 mm. long). The spikelets of these plants are more purplish than in the rest of our Cook

County material but less so than in arctic and high alpine material. The Point at Grand Marais is one of the most nearly sub-arctic of the habitats known to us on the North Shore and nanism is to be expected, especially since this particular species grows in crevices in rocky shores which are occasionally beaten by the waves practically at the temperature of ice water. Since most of our collections fall clearly into *F. saximontana* we hesitate to call the Grand Marais plants *F. brachyphylla* especially since they come from an extreme habitat for the region. Furthermore we are of the opinion that the line between *F. saximontana* and *F. brachyphylla* is very tenuous, therefore we retain the Grand Marais plants within the collective species.

GLYCERIA BOREALIS (Nash) Batch. Poplar Lake, BA 847; Brule River, C. B. Reif A26; Temperance River, C. B. Reif A22.—Rooted in rock and muck bottoms one to two feet below surface of the two above-mentioned rivers, and on pond margins.

G. CANADENSIS (Michx.) Trin. West Pike Lake, BsH 184; Lima Mountain, BA 856.—Swampy spots; occasional.

G. STRIATA (Lam.) Hitchc. Sea Gull Lake, L 3699; South Lake, L. S. Cheney 17; Rove Lake, F. F. Wood 18; Lima Mountain, BA 857; Mineral Center, Be 641; Carribeau River, BR 4517.—Stream banks, moist portage trails, swamps; common.

G. STRIATA, var. *STRICTA* (Scribn.) Fernald, *RHODORA* 31: 47. South Lake, BA 784; Birch Lake, BA 818.—Pond shores, sphagnum bogs.

G. GRANDIS S. Wats. Grand Marais, BA 979.—Around the "marais"; locally abundant.

G. FERNALDII (Hitchc.) St. John. Aspen Lake, BA 959.—In a gently flowing stream; very local.

POA ANNUA L. 11 Poplar Lake, BA 963.—Near habitations; introduced weed.

P. COMPRESSA L. Birch Lake—Poplar Lake, BA 817; Lima Mountain, BA 876; Grand Portage, BA 976; Mount Josephine, BA 1036, BA 1038; Grand Marais, BR 4654; Tofte, Lakela 7255.—Roadsides, along trails, rarely in undisturbed places; introduced.

P. PRATENSIS L. *sens. lat.* Brule River, BR 4526; Susie Island, OO 1148.—Gravelly beach; rare.

P. PRATENSIS, var. *ANGUSTIFOLIA* (L.) Sm. *cf.* Butters & Abbe, *RHODORA* 49: 5. *P. angustifolia* L. Pigeon River, BR 4623½; Grand Marais, BR 4664.—Roadsides, etc.; infrequent and introduced.

P. SALTUENSIS Fern. & Wieg., *RHODORA* 20: 122. Pigeon River, BR 4623; Mineral Center, BR 4596; Carribeau River, BR 4492.—Moist, shady river gorges and woodlands; infrequent.

P. SALTUENSIS, var. *MICROLEPIS* Fern. & Wieg., *RHODORA* 20: 124. Mineral Center, BR 4582.—Cedar-spruce swamp; rare.

P. NEMORALIS L., var. *INTERIOR* (Rydb.) Butters & Abbe, *RHODORA* 49: 6. *P. interior* Rydb. Gunflint Lake, BBl 377; Clearwater Lake, BBl

¹¹ The genus *Poa* in Cook Co., Minn. has been discussed at length by the writers in *RHODORA* 49: 1–21. 1947.

416, BBsH 6, BA 961 A-F; Lima Mountain, BA 865, BA 881; Mountain Lake, BAA 256, BAA 286, BAA 308, BBsH 47, BBsH 67, BBsH 77; West Pike Lake, BsH 182; John Lake, BM 10817a; North Fowl Lake, BABs 670; Brule River, BR 4543.—Inland cliffs (slate and diabase), hill-tops, dry rocks near shore of Lake Superior; common.

P. NEMORALIS, var. *MONTANA* Gaud., *emend.* Lindm. *cf.* Butters & Abbe, RHODORA 49: 9. North Lake, Lange 8; Clearwater Lake, BA 72; John Lake, BM 10801; North Fowl Lake, BABs 668; Mount Josephine, BR 6326, BA 184; Mount Maud, BA 199, BA 202; Carribeau River, BR 4481, BR 4482.—Inland cliffs, dry tops of hills and bluffs, both inland and near Lake Superior, river mouths; frequent.

P. PALUSTRIS L. Sea Gull Lake, BA 915; Mountain Lake—Watab Lake, BAA 316; Lima Mountain, BA 877; Susie Island, OO 1145, OO 1146; Grand Portage, R 5981, Be 467; Mount Josephine, BA 1034, BA 1040, BA 1043, BA 1046, BA 1049; Grand Marais, T. S. Roberts (s. n., no date); 12 mi. west Grand Marais, BA 757; Tofte, Lakela 7254.—Moist roadsides and portage trails, margins of woods; very common.

P. GLAUCA Vahl. Mountain Lake, BBsH 47a; Pigeon Point, BAA 422, BAA 424, BA 1009, BA 1012; Clark's Bay, BAA 388, BAA 391; Porcupine Island, AA 576; Susie Island, AA 568; Mount Josephine, BA 1031, BA 1032, BA 1037; Reservation River, BR 4567; Grand Marais, BR 4505; Thunder Bay Dist., Ont. (Boundary Islands, Pigeon Bay), AA 592a.—Rocky shores and shingle beaches of Lake Superior, occasionally on inland cliffs; common.

P. GLAUCA, subsp. *CONFERTA* (Blytt) Lindm. Lucille Island, BAA 382, OO 1103; Grand Marais, Wood 13.—Islands, shores and hills adjacent to Lake Superior; infrequent.

P. GLAUCA, subsp. *CONFERTA*, var. *LAXIUSCULA* (Blytt) Lindm. Mount Josephine, NE 2051.

P. GLAUCA, subsp. *GLAUCANTHA* (Gaud.) Lindm. Bot. Notis. (1926): 275. Watab Lake, BAA 241; Clearwater Lake, Butters & Wherry (June 29, 1935), BBsH 123, BsH 156; Little Caribou Lake, BsH 410; Rocky Lake, BsH 378; Canoe Lake, BsH 381; Mountain Lake, BAA 258, BBsH 66; MacFarland Lake, BsH 372; South Fowl Lake, BsH 282; Royal Lake and River, BsH 240, BsH 358; Pigeon Point, BAA 422a, AA 590, BA 1007, BA 1013; Lucille Island, BA 350; Long Island, AA 547; Sailboat Island, AA 535; Mount Josephine, BA 164, BA 1041.—Inland cliffs; islands, shore rocks and hills adjacent to Lake Superior; common.

P. × TORMENTUOSA Butters & Abbe, RHODORA 49: 14. *P. glauca*, subsp. *glauca* × *P. nemoralis*. Hungry Jack Lake, BsH 424; Clearwater Lake, BBsH 2, BA 961G; Little Caribou Lake, BsH 410; East Pike Lake, BsH 233; South Fowl Lake, BsH 274, BsH 303; Royal River, BsH 336; Pigeon Point, BA 1008, BA 1010, BA 1011, BA 1014.—Cliffs mostly along the border lakes; occasional.

P. SCOPULORUM Butters & Abbe, RHODORA 49: 16. Winchell Lake, BA 135; Clearwater Lake, BA 97, BA 950, BA 87, BBl 471; Mountain Lake, BAA 261, BBsH 56; Mount Josephine, BA 184a.—Slate, diabase

and gabbro cliffs; occasional. A significant endemic species belonging to the section *Oreinos* (*sensu* Nannfeldt), an essentially alpine group which in eastern North America is otherwise represented by *Poa Fernaldiana* Nannf.

PHRAGMITES COMMUNIS Trin. *cf.* Fernald, *RHODORA* **43**: 286. Canoe Lake, BsH 374.—In shallow water by portage trail; infrequent.

AGROPYRON TRACHYCAULUM (Link) Malte, var. *TYPICUM* Fernald, *RHODORA* **35**: 169. Lima Mountain, BA 884; Grand Portage, BA 1029; Mount Josephine, BA 1042.—Mixed woods, dry hilltops.

A. TRACHYCAULUM, var. *NOVAE-ANGLIAE* (Scribn.) Fernald, *RHODORA* **35**: 174. Clearwater Lake, BBl 414; Mountain Lake, BAA 257, BBsH 49; Pigeon Point, R 6053, R 6281; Mount Josephine, BA 186; Mount Maud, BA 200.—Scree slopes, dry hilltops; occasional. BA 200 tends toward var. *glaucum* (Pease & Moore) Malte.

A. REPENS (L.) Beauv. (typical). *cf.* Fernald, *RHODORA* **35**: 184. Grand Portage, Be 477.—Roadsides; infrequent.

A. REPENS, f. *TRICHORRHACHIS* Rohlena. *cf.* Fernald, *RHODORA* **35**: 184. Brule River, BR 4523.—Rare; gravelly beach near river mouth. Apparently a range extension, since Fernald, *loc. cit.*, p. 184, has described its range as "Newfoundland and Saguenay Co., Quebec to Connecticut and western New York; Oregon." He gives essentially this range in Gray's Manual, ed. 8, but excludes Oregon.

A. REPENS, var. *SUBULATUM* (Schreb.) Reichenb., f. *VAILLANTIANUM* (Wulf. & Schreb.) Fernald, *RHODORA* **35**: 184. Grand Marais, R 5999.—Sandy, gravelly beach of Lake Superior; rare.

HORDEUM JUBATUM L. Grand Portage, Be 670, SS (June 28, 1948).—Sporadic as a roadside weed.

ELYMUS VIRGINICUS L., var. *VIRGINICUS*. *cf.* Fernald, *RHODORA* **35**: 198. Gunflint Lake, R 5451.—Very uncommon.

E. WIEGANDII Fernald, *RHODORA* **35**: 192. Grand Portage, BA 1024.—Thicket by brook; rare.

Reported most recently by Fernald in Gray's Manual, ed. 8, as occurring in "Alluvial soil, Gaspé Co. to L. St. John, Que., s. and s. w. to s. N. B., N. E. and Pa." making the occurrence in Cook County a considerable extension of range.

TRisetum SPICATUM (L.) Richter, var. *PILOSIGLUME* Fernald, *RHODORA* **18**: 195. Pigeon Point, B (Sept. 3, 1927), BAA 425 & 448; Grand Marais, BM 10765 & 10766; Tofte, BR 4466, R 7818.—Shore rocks of Lake Superior.

T. SPICATUM, var. *MOLLE* (Michx.) Beal, Grasses N. A. 2: 377. Pigeon Point, BAA 389, BAA 449; Lucille Island, BAA 349.—Shore rocks of Lake Superior.

T. SPICATUM, var. *MAIDENII* (Gand.) Fernald, *RHODORA* **18**: 196. Pigeon Point, BAA 427, BBs 732, BBs 733, BBs 734, BBs 735; Porcupine Island, AA 575, AA 580, OO 1053; Grand Portage, BA 205.

T. SPICATUM—intermediates between var. *molle* and var. *Maidenii*. Pigeon Point, BBl 356, BAA 447; Lucille Island, BAA 348 & 380b; Grand

Marais, F. F. Wood (Jun. 29, 1891). *T. spicatum* sens. lat. is very abundant on the rocky shores and islands of Lake Superior; the intermediates between var. *molle* and var. *Maidenii* are apparently the most abundant phase of the *T. spicatum* complex in this region. The characters assigned to vars. *molle* and *Maidenii* vary independently, so that an infinite series of combinations and permutations as to stature, size of spikelets, density of spikes, and color are to be found in the region. There is a strong similarity of behavior in this respect to what may be expected in the variously selfed and backcrossed progeny of a cross involving vars. *molle* and *Maidenii* as the parental types.

Whether any of our collections can be identified with any of the more northern varieties listed by Louis-Marie (RHODORA 30: 239) is not obvious from his work nor from the original descriptions upon which his transfers are based.

AVENA FATUA L. Hovland, Be 660.—One of the commonest weeds in the state, although by no means abundant in Cook Co.

DESCHAMPSIA FLEXUOSA (L.) Trin. Pigeon Point, BAA 397, BAA 415, BBs 723; Grand Portage, BM 10888.—Rare; near the shore of Lake Superior. The collection made by Mrs. Abbe and the writers (397) is the first known from Minnesota. It was collected somewhat later the same summer (1937) near Duluth by Miss Lakela. The range for North America as reported by Hitchcock (Man. Grasses, U. S., p. 289) is "Greenland to Alaska, south to North Carolina, Michigan and Wisconsin; Oklahoma . . ."

D. CAESPITOSA (L.) Beauv., var. GLAUCA (Hartm.) Lindm. f. cf. Fernald, RHODORA 28: 154. Pigeon Point, BBl 355, BAA 387 & 394, BAA 428 & 435, BBs 741; Porcupine Island, AA 573, OO 1015; Susie Island, OO 1147; Lucille Island, BAA 365, BAA 366, BAA 368, OO 1102; Long Island, AA 502, AA 551; Grand Portage Island, R 6026; Grand Marais, F. F. Wood (Jun. 29, 1891); Tofte, BR 4464, R 7817.—Localized; crevices of rocks, rocky shores of Lake Superior. The range of variation is great in this material, although it all comes within that allowed by Fernald (*loc. cit.*, p. 153). Especially noteworthy are collections BAA 387 and BAA 368. The stiff leaves form tight dense tufts, the blades about 4 cm. long. The culms are very stiff, from 4 to 24 cm. high (including the panicle). The panicles are from 2 to 8 cm. long, having relatively few, rather short divergent branches which are few-flowered. The leaf blades on the culms are very short and hardly divergent giving the plants a very strict appearance. It is not unlikely that this is an ecological form associated with the limited accommodations available for the root system. It is however a form of distinctive appearance. Similar material has been collected on Isle Royale.

DANTHONIA SPICATA (L.) Beauv., var. PINETORUM Piper *D. thermalis* Scribn. Sea Gull Lake, L 3674; Birch Lake, BA 799; Watab Lake, BAA 322a; Clearwater Lake, BBl 472; Lima Mountain, BA 872, BA 880; Mountain Lake, BAA 268, BBsH 36; East Pike Lake, BsH 211; South Fowl Lake, BM 10843; Pigeon Point, BAA 414; Sailboat Island, AA 543;

Grand Portage, BM 10887; Mount Josephine, BA 187; Mount Maud, BA 201; Grand Marais, BA 772.—Mostly on dry hilltops and talus slopes, and in cracks of shore rocks. Rare in Minnesota, being primarily known from the Arrowhead region. This is a category of *D. spicata* which has been variously treated. It was described by Piper (Erythea 7: 103, Oct. 1899) as *Danthonia spicata pinetorum* from Mason Co., Washington. Piper says (*loc. cit.* p. 104) "Although the plant occurs widely separated from the range of *D. spicata* R. & S., it is scarcely more than a variety of that species, differing mainly in character of pubescence." It was described as a species by Scribner (U. S. D. A., Div. Agrostol. Circ. 30: 5, 1901) as *Danthonia thermale* (*sic!*) from Yellowstone Park. It was recognized as a species by Piper (Flora Washington, Contrib. U. S. Nat. Herb. 11: 122, 1906) under the name *Merethrepta pinetorum* for which he cites the synonym *D. thermalis*. Rydberg (Fl. Rocky Mts. and adjacent Plains) keeps it as a species and keys it as follows:

Empty glumes 11–13 mm. long, conspicuously nerved, broad; teeth of the lemma subulate, 1–2 mm. long.	2. <i>D. thermalis</i>
Empty glumes 8–10 mm. long, narrow; teeth of the lemma ovate, often only 0.5 mm. long.	3. <i>D. spicata</i>

Rydberg gives the range of *D. thermalis* as B. C.—Wash.—Wyo. and that of *D. spicata* as Newf.—N. C.—N. M.—B. C. In his Flora of the Prairies and Plains he extends the former to include "S. D." and the latter to include "Kans."

Hitchcock (U. S. D. A. Misc. Pub. 200: 303) reduces *D. thermale* to synonymy under *D. spicata* with the remark "A rather stiff western form with subsetaceous teeth has been described as *D. thermale* Scribn."

Rydberg's key reproduced above is much too categorical. There is continuous variation in the length of the glumes, not a break between 10 and 11 mm. The other glume characters noted by Rydberg seem to be wholly illusory. The length of the teeth of the lemma also varies greatly, and it is even possible to find lemmas with one tooth setaceous prolonged and the other nearly triangular. Nevertheless, nearly all Rocky Mountain and far western material that we have seen has larger spikelets than most eastern material, and somewhat longer and sharper teeth on the lemmas, though there is pretty complete intergradation. The western plant seems to be a fairly distinct geographical variety.

All our Cook County plants seem to belong to var. *pinetorum*, also two specimens from Thomson, Minn. collected by J. H. Sandberg in June and July 1891. All other Minnesota specimens in the Herbarium of the University of Minnesota are ordinary *D. spicata*. Other eastern specimens of this variety that we have seen are: Keweenaw Co., Mich. O. A. Farwell 534; Isle Royale, Mich. W. S. Cooper 285; and Quiddy Viddy, Newfoundland, B. L. Robinson and H. Schrenk 199. The amount of pubescence on the leaves is very variable and does not correlate with any of the other characters. The Sandberg specimens mentioned above are nearly glabrous.

Typical *D. spicata* and its var. *pinetorum* may be contrasted as follows:

Typical <i>D. spicata</i>	var. <i>pinetorum</i>
1. Glumes mostly under 1 cm. in length except for occasional stray spikelets	Spikelets practically all over 1 cm. long and up to 13 mm.
2. Teeth of summit of lemma acute and relatively short	Teeth of summit of lemma sub-setaceous and relatively long

CALAMAGROSTIS PURPURASCENS R. Br. cf. Fernald, RHODORA 35: 213. Watab Lake, BBsH 108; Mountain Lake, BAA 263, BBsH 58; South Fowl Lake, BsH 275; Thunder Bay District, Ont. (South Fowl Lake), BABs 711.—Cliffs of the Border Lakes; rare.

This is one of the notable species and range extensions of the region. Fernald (*loc. cit.*) characterizes it as having "a remarkably disrupted range" giving this as "the unglaciated margin of Greenland; arctic northwestern Canada, thence along the Cordillera to South Dakota, Colorado, Nevada and California; with the only known station in the East (south of Greenland) a single colony on one of the highest cliffs of Bic, Quebec." In Gray's Manual, ed. 8, Fernald adds only the Mountain Lake station cited above and L. Mistassini.

C. CANADENSIS (Michx.) Nutt., var. CANADENSIS. cf. Stebbins, RHODORA 32: 39. Watab Lake, BAA 317; Mountain Lake, BAA 307; Susie Island, OO 1016; Grand Marais, BA 756.—Roadsides; frequent. BA 756 is a phase with hirsutulous sheathes.

C. CANADENSIS, var. MACOUNIANA (Vasey) Stebbins, RHODORA 32: 41. Gunflint Lake, BBl 380.—The most abundant of the varieties in the state.

C. CANADENSIS, var. ROBUSTA Vasey. Pigeon Point, BAA 418; Porcupine Island, AA 579; Susie Island, OO 1150; Long Island, AA 525. The only other Minnesota collection of this variety in the Herbarium of the University of Minnesota is from Two Harbors, also on the shore of Lake Superior.

C. CANADENSIS, var. SCABRA (Presl) Hitchcock, Amer. Jour. Bot. 21: 135. *C. canadensis*, var. *Langsdorfii* (Link) Inman. cf. Stebbins, RHODORA 32: 43. Lucille Island, BAA 358.

While Stebbins (*loc. cit.*) has seen material of this circumpolar variety from nearby Isle Royale, none from Minnesota was apparently at hand when he prepared his revision of Calamagrostis. This, from shore rocks of Lake Superior, would then appear to be the first to be reported from Minnesota (*cf.* Fernald, Gray's Manual, ed. 8, p. 157).

C. INEXPANSA A. Gray, var. BREVIOR (Vasey) Stebbins, RHODORA 32: 50. Lima Mountain, BA 875, BA 879; Pigeon Point, BAA 450; Belle Rose Island, OO 1065; Long Island, OS 1117.—General in the state, although not much collected.

AGROSTIS ALBA L. Partridge Lake, BA 789; Lima Mountain, BA 866; Grand Portage, Be 673; Mount Josephine, BA 1035.—Trails, openings in woods, and fields; questionably native.

A. SCABRA Willd. cf. Fernald, RHODORA 35: 207. South Lake Trail, BA 812; Clearwater Lake, BBl 465, BA 960; Little Caribou Lake, BsH

405; Porecupine Island, OO 1014; Susie Island, AA 567; Grand Portage, Be 622; Grand Marais, BR 6912.—Cliffs, trails and rocky lake shores; frequent.

A. GEMINATA Trin. Clearwater Lake, BBl 415; Mountain Lake, BBsH 37.—Cliffs.

A. GEMINATA, f. EXARISTATA Fernald, RHODORA **35**: 211. Sea Gull Lake, L 3677; Clearwater Lake, BBl 465, BsH 161; Mountain Lake, BBsH 55; Lucille Island, BAA 355; Long Island, AA 546.—Cliffs and shore rocks.

CINNA LATIFOLIA (Trev.) Griseb. Poplar Lake, L. W. Orr 4; Hungry Jack Lake, BR 6331; Grand Portage Bay, R 6018; Kimball Creek, R 2611.—Shady woods and moist portage trails.

PHLEUM PRATENSE L. South Fowl Lake, BsH 263; Grand Portage, Be 564; Brule River, BR 4527.—Portage trails, roadsides, meadows, beaches; introduced and thoroughly naturalized as the commonest hay grass along with *Agrostis alba* L.

ALOPECURUS AEQUALIS Sobol. cf. Fernald, RHODORA **27**: 196. South Fowl Lake, BsH 310; Royal River, BABs 713; Grand Portage, Be 470.—On occasionally flooded portage trails and rubble beaches; locally abundant but infrequent. BABs 713 has the repent habit and inflated sheathes of *A. aequalis*, var. *natans* (Wahlenb.) Fernald (*loc. cit.* p. 198) but has the spikes up to 5 cm. in length and the upper leaf sheath up to 7 cm. long, in which it exceeds the dimensions given by Fernald in his description of the variety.

ORYZOPSIS ASPERIFOLIA Michx. Poplar Lake, D 29.—Roadside; infrequent.

O. PUNGENS (Torr.) Hitchc., Contr. U. S. Natl. Herb. 12: 151. Sea Gull Lake, L 3609; Moss Lake, D 134; Rove Lake, BBsH 99; Mountain Lake, BAA 230.—Dry rocks and cliffs; northern part of the state, except for an occurrence in a southern relic stand of Jack pine in the Root River Valley (Fillmore County) in the Driftless Area.

The specific concept which we are here following is that expressed by Hitchcock (*loc. cit.* and Manual Grasses U. S., p. 417), rather than that expressed by Fernald (RHODORA **35**: 215) in his synonymy for *O. canadensis* (Poir.) Torr., namely "*(Oryzopsis pungens* (Torr.) Hitchc.; *Stipa canadensis* Poir.)." It is abundantly clear from cytological and statistical studies made by Dr. B. Lennart Johnson (Bot. Gaz. **107**: 1-32. 1945) that *O. pungens* and *O. canadensis* are two distinct species and that Hitchcock's recognition of this species is justifiable.

PHALARIS ARUNDINACEA L. Gunflint Lake, F. F. Wood 5 & L. S. Cheney (Jul. 18, 1891).—Infrequent.

HIERCHLOË ODORATA (L.) Beauv. Grand Portage, BAA 455; Mount Josephine, NE 2050.—Open woods; not at all abundant in Cook Co., although general in Minn.

Our material is a good match for European material in the Herbarium of the University of Minnesota rather than for *H. odorata*, var. *fragrans* (Willd.) Richter (cf. Fernald, RHODORA **19**: 152).

ZIZANIA AQUATICA L., var. *ANGUSTIFOLIA* Hitchc. RHODORA 8: 210. Royal Lake, BsH 308.—Shallow lakes and ponds with mud bottom; locally abundant, but suitable habitats rather scarce.

PANICUM LINEARIFOLIUM Scribn. Sea Gull Lake, L 3694.—In lichen mats on rocky ridge.

P. SUBVILLOSUM Ashe. Sea Gull Lake, L 3701.—Dry, rocky ridge.

CYPERACEAE

DULICHIMUM ARUNDINACEUM (L.) Britton. East Pope Lake, "L. W. K." 19; Hungry Jack Lake, BR 6352.—Edge of ponds and lakes; rare.

ELEOCHARIS ACICULARIS (L.) R. & S. Lake Saganaga, BA 938; Poplar Lake, BA 942.—Shallow margins of lakes.

E. OVATA (Roth) R. & S., var. *HEUSERI* Uechtritz cf. Svenson, RHODORA 31: 214. Mark Creek, C. B. Reif A23 (*teste* "?" H. K. Svenson, 1945).—Mucky stream bottom.

E. SMALLII Britton cf. Svenson, RHODORA 41: 63. Seagull River, BA 936; Round Lake, C. B. Reif A13; Little Gunflint Lake, D. Lange (June 29, 1917); Leo Lake, BR 6338.—Shallow water, often on sandy bottom. The above collections, before checking by H. K. Svenson in 1945, had been referred to *E. palustris* (L.) R. & S., var. *major* Sonder.

E. CALVA Torr. cf. Svenson, RHODORA 41: 63. Pigeon River, BR 4609 (*teste* "?" H. K. Svenson, 1945).—River bank.

E. NITIDA Fernald. Schroeder, BA 1063, L 6399, L 6405, L 6426, OO 993.—In roadside ditch; very rare. This fascinating little *Eleocharis*, with its fully ripe golden-yellow achenes and forming dense sods in which its rhizomes were densely interlaced, is represented for the first time in Minnesota by BA 1063 (Aug. 15, 1944). It was one of the last collections made by Dr. Butters in Cook County on his last collecting trip, and his delight over the find is memorable.

The occurrence of *E. nitida* in Cook County is a notable range extension. It was reported by Svenson (RHODORA 34: 203) as seen by him from Newfoundland (4 collections), Quebec (1 collection), Nova Scotia (1 collection), and New Hampshire (1 collection). Specimens (authenticated by H. K. Svenson) in the Herbarium of the University of Minnesota which extend this range are:—from Douglas County, Wisconsin (J. W. Thomson, Jr. 5235, Jul. 4, 1943), from Glacier, B. C. (F. K. Butters, Jul. 30, 1913; F. K. Butters, Sept. 1920). Additional stations in n. e. Minnesota have been reported by Lakela (RHODORA 49: 81-82). Its discovery in Cook County adds one more to the list of species which were first intensively studied in sub-boreal eastern America, and are now being found in the Great Lakes area.

E. ELLIPTICA Kunth cf. Svenson, RHODORA 41: 65. Grand Portage, BR 6300 (! H. K. Svenson, 1945).—Border of pond in cedar woods.

SCIRPUS CESPITOSUS L., var. *CALLOSUS* Bigel. cf. Fernald, RHODORA 23: 24. Pigeon Point, BAA 412; Morrison Bay, BBs 724; Porcupine Island, OO 1050; Susie Island, R 6061; Lucille Island, N 1655, BAA 359; Grand Marais, BR 4650, R 5965, BA 51, BR 6911; Tofte, R 7820.—Forming mats on moist rocks of the shore of Lake Superior.

Elsewhere this occurs in the state farther west along the north shore of Lake Superior, in Ramsey County, and in a marl bog in the Minnesota Valley in Scott County. The latter is *not* the calcicolous form with dark basal bracts and more delicate culms, described by Fernald as var. *delicatulus* (RHODORA 23: 25).

S. HUDSONIANUS (Michx.) Fernald, RHODORA 8: 161. Grand Portage, BR 6301, Butters and Wherry (June 29, 1935), SS 12032; Schroeder, L 3724, L 6408.—Cedar swamp, swampy roadside; infrequent. The only other localities for the state, as represented in the Herbarium of the University of Minnesota, are in Lake and St. Louis Counties and near Park Rapids.

S. SUBTERMINALIS Torr. Brule River, C. B. Reif A28; Temperance River, C. B. Reif A21.—Sandy and rocky river bottoms.

S. ACUTUS Muhl. *ex* Bigel. *cf.* Fernald, RHODORA 22: 55. Bearskin Lake, U. S. F. S. (Aug. 25, 1935).

S. FLUVIATILIS (Torr.) Gray. Lake Saganaga, L. S. Cheney (Jul. 23, 1891).

S. RUBROINCTUS Fernald. Grand Portage, Be 548, R 7899.—Old portage trail, turf.

S. PEDICELLATUS Fernald. Sea Gull River, BA 935; Pigeon River, BR 6268.—Marshy ground, and in streams.

S. ATROCINCTUS Fernald. Sawbill Lake, Bg 12; Gunflint Lake, BR 6281; Hungry Jack Lake, BR 6337; West Pike Lake, BsH 174; Grand Portage, Be 576.—Old portage trails, roadside ditches, moist ground.

S. ATROCINCTUS, f. BRACHYPODUS (Fern.) S. F. Blake. Clearwater Lake, BBl 438.—Gravelly shore.

ERIOPHORUM SPISSUM Fernald, RHODORA 27: 208. Clark's Bay, BAA 400; Schroeder, NBr 3197.—Muskegs.

E. ANGUSTIFOLIUM Honckeney. Sea Gull Lake, L 3671; Cross River, BA 912.—Sphagnum bogs; local and apparently infrequent.

RHYNCHOSPORA ALBA (L.) Vahl. Grand Portage, BR 6299.—Cedar forest.

CAREX STIPATA Muhl. Clearwater Lake, BsH 153; Grand Portage, Be 473, BA 1051, SS 12022.—Moist areas along trails.

C. DISPERMA Dewey. Sea Gull Lake, L 3721; North Lake, D. Lange (Jul. 1, 1917); Winchell Lake, BA 142; Poplar Lake, D 51; Clearwater Lake, BA 98; South Fowl Lake, BABs 639; Clark's Bay, BAA 402; Grand Portage, R 5963, BA 974; Mineral Center, BR 4579.—Moist situations generally; common.

C. TRISPERMA Dewey. Sea Gull Lake, L 3712; Mountain Lake, BBsH 74; Clark's Bay, BAA 399; Grand Portage, R 6007, BA 975.—In acid bogs; common.

C. TENUIFLORA Wahlenb. Between Sea Gull Lake and Lake Saganaga, BA 909, BA 910.—Mucky soil in muskeg.

C. CANESCENS L. Porcupine Island, BBs 753, OO 1019; Susie Island, OO 1039; Lucille Island, OO 1087; Long Island, BAA 468.—Moist places by rock pools.

C. CANESCENS, var. *LOLIACEA* Laestad. Grand Marais, BM 10768.—On the "Point."

C. CANESCENS, var. *SUBLOLIACEA* Laestad. Birch Lake, BA 829; Rove Lake, F. F. Wood 7; Watab Lake, BBsH 18; Mountain Lake, BAA 287; Pigeon Point, BAA 441; Porcupine Island, AA 569; Long Island, AA 529; Grand Portage, BA 973.—Moist areas near pools and portage trails. The leaves of the over-mature collection AA 569 are very narrow (1.5–2 mm.) and not markedly glaucous (in the latter respect resembling *Pl. Gray*. Exsicc. 530), but this may be because of age in our material.

BAA 441 is very depauperate. The culms are 0.6 to 1.2 dm. high and tend to be curved and the leaves are narrow (about 0.5 mm. wide), so that all together it simulates var. *fallax* F. Kurtz, ex Kükenth. as described by Kükenth. (*Pflanzenreich*, IV: 20, p. 217).

C. BRUNNESCENS (Pers.) Poir. Sea Gull Lake, L 3712; Clearwater Lake, BBsH 4; Mountain Lake, BBsH 90; South Fowl Lake, BABs 641; Royal Lake, BM 10852; Clark's Bay, BAA 392; Porcupine Island, BBs 750, BBs 751; Grand Portage, R 5986; Mineral Center, BR 4597.—Mostly in damp woods; common.

C. DEWEYANA Schw. Loon Lake, D 166; Rove Lake, BBsH 113; Mountain Lake, BAA 306; East Pike Lake, BsH 217; North Fowl Lake, BABs 671; South Fowl Lake, BABs 620; Mineral Center, BR 4602; Grand Marais, BR 4661.—Cliffs and dry slopes.

Mackenzie's statement (*N. A. Fl.* 18: 116) that the perigynia vary in length from 4.5–5.5 mm. does not hold. Many specimens in the Herbarium of the University of Minnesota labelled *C. Deweyana* by Mackenzie have perigynia only 4 mm. long, and this excludes consideration of *C. leptopoda* Mackenzie and *C. Bolanderi* Olney.

C. CEPHALANTHA (Bailey) Bicknell. Birch Lake, BA 828; Grand Marais, R 5962.—Moist places on rocks near the lake shore.

C. ANGUSTIOR Mackenzie. Sea Gull Lake, L 3685; Clearwater Lake, BsH 167; Mountain Lake, BBsH 144; West Pike Lake, BsH 173; Grand Portage, BM 10879; Schroeder, BA 1058.—Portage trails, wet woods, swampy openings, wet roadsides.

C. SCOPARIA Schkuhr. Schroeder, BA 1071.—Roadside ditch.

C. TRIBULOIDES Wahlenb. Grand Portage, R 7896.—Edge of beach.

C. PROJECTA Mackenzie. Grand Portage, Be 476; Grand Marais, H. W. Slack (July 1892).—Edge of woods.

C. CRAWFORDII Fernald. Sea Gull Lake, BA 919; Gunflint Lake, F. F. Wood 11, L. S. Cheney 9; Poplar Lake, BA 846; South Fowl Lake, BsH 296; Grand Portage, Be 590; Schroeder, BA 1084; Thunder Bay Dist., Ont. (Mountain Lake), BAA 314.—Rubble beaches, rocky shores, roadsides.

C. MERRITT-FERNALDII Mackenzie. Clearwater Lake, BBl 453; North Fowl Lake, BABs 669; Grand Portage, R 7889.—Ledges and shoulders of cliffs, clearings. Not cited by Mackenzie (*N. A. Fl.* 18: 156) as seen from Minnesota, but omitted through an oversight because several sheets from the state in the Herbarium of the University of Minnesota bear his annotations.

C. XERANTICA L. H. Bailey. Watab Lake, BA 117 (teste M. L. Fernald).—Dry hill-top. First authentic record for Minnesota of this species of "prairies and plains, Manitoba to Alberta and southward to New Mexico" (Mackenzie, N. A. Fl. 18: 168). Some other prairie plants, such as *Heuchera Richardsonii* and *Danthonia spicata*, var. *pinetorum* also occur on these dry hilltops.

C. ADUSTA Boott. Mountain Lake, BBsH 40.—Hill-top.

CAREX AENEA Fernald in Cook County, Minnesota.—Our material from Cook County, Minn. gave us a great deal of trouble when we attempted to identify it by using the keys in Fernald (Proc. Amer. Acad. Arts & Sci. 37: 480, 1902), in Gray's Manual (ed. 7) and in Mackenzie (N. A. Fl. 18: 123). The chief problem lay in distinguishing "*C. foenea*" (*C. argyrantha* Tuckerm. in Dewey; cf. Svenson, RHODORA 40: 325) from *C. aenea* Fernald. These keys utilize various combinations of veininess, color and nature of the beaks of the perigynia and the color of the scales, depending on the key involved. Our specimens, in part, insisted upon straddling the lines drawn between the two species, although a fair proportion of them fell clearly into *C. aenea*. Nor were the detailed descriptions of help in resolving the difficulty. Finally in desperation we appealed to Professor Fernald for authentic material of "*C. foenea*" (*C. argyrantha* Tuckerm.) which we lacked in the Herbarium of the University of Minnesota. He kindly sent us a number of sheets, and with their help and with the sheets cited in connection with his original description of *C. aenea* we arrived at the following characteristics of the perigynia which could be used independently of their form or veininess:

Wings a little wider in *C. argyrantha* and with their margins irregular-laciniate, while in *C. aenea* the margins are dentate-serrate, the individual teeth acuminate.

Ventral surface so thin in *C. argyrantha* that the dark achenes may be seen through the tissue, while this is not possible in *C. aenea*. Also the tissue of this surface is more cellular in *C. argyrantha* than it is in *C. aenea*.

It is desirable to point out a by-product of our study of the achenes. These are described by Mackenzie (*op. cit.*) as dull in *C. aenea*. This is true, but with marked limitations. The appearance of the achene is a matter of age. In a specimen collected by Dr. Rosendahl (no. 6000), achenes from young inflorescences may be compared with those of the previous year, the culms all being attached to the same root system. The young achenes are dull, and minutely pitted, while mature achenes are markedly shiny and smooth probably because of the development of a thick layer of cutin. Very mature achenes develop a cloudiness which is associated with the development of air pockets under the cuticle. This cloudiness is readily dispelled by boiling the achenes in water and it reappears upon their drying out. The nature of the surface appearance of the achene therefore has but little diagnostic value, since in mature material it will range from shiny to cloudy.

Our Cook County material, using the criteria described in the first paragraph above, turned out to be *C. aenea* exclusively, but varied con-

siderably in form and veininess of the perigynium and in the form of the achene. More than half of the specimens fell clearly into the type of material originally described by Fernald and exemplified by his collection of June 8, 1901 (gravelly bank, Orono, Maine). These specimens have ovate-lanceolate perigynia which are veinless to moderately veined on the ventral face, and ovate achenes. The balance of our specimens fall into three categories: (a) plants with perigynia typically ovate-lanceolate, but more veiny on the ventral surface, and with narrow leaves; (b) one collection in which the perigynia are suborbicular to broadly ovate, the venation as in the typical material; (c) plants with the perigynia elliptic-lanceolate and rather strongly veined on the ventral face. It appears to us that as the species is studied over its east-west range, that there is a tendency for somewhat more variation in some of its characteristics in our area than at the eastern limits of its occurrence. These variants are considered in more detail below.

CAREX AENEA Fernald (typical). Proc. Amer. Acad. Arts & Sci. **37**: 480. 1902. Perigynia ovate-lanceolate, veinless to moderately veined on the ventral face; achenes ovate. LECTOTYPE, M. L. Fernald, June 8, 1901, gravelly bank, Orono, Maine (in Herb. Gray).

C. AENEA, f. **extrapolata**, n. f. Utriculi ventre nervosi, ovati-lanceolati; nuces ovatis. Foliis 1.75–2.5 mm. latis. TYPE, Butters, Burns & Hendrickson 102, Jul. 11, 1938, thin soil on diabase, top of cliff south of Rove Lake, Cook County, Minn. (in Herb. Minn.). Other specimens from Cook County, Minn. (in Herb. Minn.)—F. F. Wood 12, Jul. 20, 1891, Mosquito Bay, Gunflint Lake; Butters, Burns & Hendrickson 57a, Jul. 7, 1938, on rocks along base of cliff, west end of Mountain Lake; Butters, Abbe & Burns 674, Jul. 1, 1940, cliff on west side of North Fowl Lake; Butters & Moore 10822, Jul. 2, 1939, top of bluff above Pigeon River at lower end of South Fowl Lake; Butters & Moore 10831, Jul. 2, 1939, cleft in cliff above Pigeon River at lower end of South Fowl Lake.

This form differs from typical *C. aenea* in the more veiny ventral surface of the perigynium, and in the relatively narrow leaves (1.75–2.5 mm. in width); it resembles typical *C. aenea* in its ovate-lanceolate perigynium and ovate achene.

C. AENEA, f. **flumini-regalis**, n. f. Utriculi ventre nervosi, ellipticis-lanceolatis; nuces ellipticas, ca. 2.2×1.5 mm. TYPE, Burns & Hendrickson 338, Jul. 29, 1938, east-facing cliff $\frac{3}{4}$ mi. east of the source of the Royal River, Cook County, Minn. (in Herb. Minn.). Other specimens from Cook County, Minn. and from near-by Ontario (in Herb. Minn.)—Abbe & Abbe 542a, Aug. 19, 1937, Sailboat Island; Rosendahl 5983, Aug. 10, 1929, along forest road along crest Hat Point, Grand Portage; Butters, Sept. 11, 1929, Isle St. Ignace, Ont.

This form differs from typical *C. aenea* in its elliptic-lanceolate perigynia which are rather strongly veined on the ventral face, and in its elliptic achenes. In all of the collections the achenes are fairly glossy, presumably because the plants were collected well along in the growing season. The lack of diagnostic significance of this character has been pointed out above.

The extreme phase referred to earlier, in which the perigynia are sub-orbicular to broadly ovate, and somewhat veiny on the ventral face, and with the achenes elliptic as in f. *flumini-regalis*, is represented by but a single collection. It is therefore not considered desirable to assign a name to it until more material becomes available. The collection involved is Butters & Buell 334, Jul. 7, 1932, brushy hill-top MacFarland Lake, Cook County, Minn.

C. PRATICOLA Rydb. *C. pratensis* Drejer. Watab Lake, BA 118; Clearwater Lake, BA 63, BA 127; Mountain Lake, BAA 249, BBsH 48; South Fowl Lake, BM 10842; Lutsen, NBr 3159.—Cliffs. Not represented heretofore in the Herbarium of the University of Minnesota, nor is it mentioned by Mackenzie (N. A. Fl. 18: 141) as seen from Minnesota.

C. LEPTALEA Wahl. Sea Gull Lake, L 3711; Moose Lake, BAA 285; Pigeon River, BR 4557; Schroeder, BA 1078.—Moist portage trails, roadside ditches, spruce-cedar and tamarack swamps; common.

C. BACKII Boott. Watab Lake, BA 119, BAA 243; South Fowl Lake, BM 10819, BM 10840.—Cliffs and hill-tops; rare. This has been collected from but three other localities in Minnesota, namely Taylor's Falls, Itasca Park and near Duluth.

C. SUPINA Wahlenb. Clearwater Lake, BA 128.—Cliff talus; very rare.

There are no other specimens from Minnesota in the Herbarium of the University of Minnesota. It was reported from Minnesota under the name *C. obesa* All., var. *minor* Boott by L. H. Bailey (Bot. Gaz. 17: 148) as collected by F. F. Wood upon high bluffs at South Fowl Lake. South Fowl Lake is in Cook County about seventeen miles east as the crow flies from Clearwater Lake where we collected it. Presumably it is Bailey's report of Wood's collection which has led Mackenzie (N. A. Fl. 18: 182) and Rydberg (Fl. Pr. & Pl., 177. 1932) to include Minnesota within the range of this species. The station at South Fowl Lake has been lost for nearly half a century, so that our find of the species at Clearwater Lake in 1936 is a desirable reaffirmation of its presence in the state.

It is a wide-spread species, occurring according to Böcher (Medd. Grönl. 106, no. 2, p. 237. 1938) in central, south, and east Europe, Caucasus, Altai, Himalayas, East Siberia, Athabaska-Great Slave Lake region of Canada. Duman (Cath. Univ. Amer., Biol. ser. 36: 65) reports it from Baker Lake and Churchill in Canada, and in East and West Greenland. It is characterized by Böcher as being a "pronouncedly continental sub-arctic steppe plant" outside of Greenland and as occurring in Greenland in "inland" localities sometimes ranging high up on the mountains on dry southern slopes. The cliff-talus on which it was collected by us in Cook County is well-drained and north-facing, and has relatively little vegetation on large portions of the slope, so that competition with the usual temperate shade-producing species is not a factor in its survival. The presence of *C. supina* in Cook County seems to be the southernmost point in its range in North America.

C. COMMUNIS L. H. Bailey. Poplar Lake, D 96; Clearwater Lake, BA 891.—Dry cliffs and woods.

C. PECKII Howe. Loon Lake, D 161; North Lake, D. Lange 4; Clearwater Lake, BA 62, BA 79a; Mountain Lake, BAA 253, BAA 271, BBsH 122; John Lake, BM 10807; South Fowl Lake, BABs 615, BABs 616; Pigeon River, BR 4613; Carribeau River, BR 4503; Thunder Bay Dist., Ont. (North Fowl Lake), BABs 691.—Cliffs, ravines, and rocks.

C. DEFLEXA Hornem. Loon Lake, D 163; Poplar Lake, D 41, D 43, D 88; Rove Lake, BBsH 104; Clearwater Lake, BA 69a, BA 70, BA 78.—Cliffs and dry open pine woods on ridges. Our material has slender rootstocks as called for in Mackenzie's description (N. A. Fl. 18: 199). In Gray's Man. (ed. 8) it is described as "tufted" and Exsicc. Grayanae no. 78 is tufted with no evident rootstocks. However, material collected by Collins and Fernald (St. Jean l'Évangéliste, Nouvelle, Quebec, July 19 & 20, 1904), as well as other specimens from the north-east, have the slender rootstocks described by Mackenzie.

This species was not represented from Minnesota in the Herbarium of the University of Minnesota prior to our collections of 1936 at Clearwater Lake. Nor is it cited by Mackenzie (*loc. cit.*) as seen from Minnesota. Apparently it is a new record for the state.

C. ROSSII Boott. Thunder Bay Dist., Ont. (North Fowl Lake), BABs 692.—Cliff, rare. There is only one collection from Minnesota in the Herbarium of the University of Minnesota (J. H. Sandberg, Carlton Co., June 1891). This northwestern plant is certainly to be expected in Cook County.

C. UMBELLATA Schkuhr *cf.* Fernald, RHODORA 44: 288. *C. rugosperma sensu* Mackenzie (N. A. Fl. 18: 205). Sea Gull Lake, L 3610.—In lichen mats on high rocks.

C. ABDITA Bicknell. *cf.* Fernald, RHODORA 44: 288. *C. umbellata* Schkuhr *sensu* Mackenzie (N. A. Fl. 18: 204). Clearwater Lake, BA 79, BA 99; Clark's Bay, NBr 3227A; Lucille Island, BAA 361.—Inland cliffs and shore rocks. Both BA 99 and BAA 361 have the beak short and therefore nearly triangular. NBr 3227A varies a great deal in the length of the beak of the perigynium in the same plant, from less than, to equal to the length of the body of the perigynium. The variation seems to be associated with the position of the achene in the perigynium since a shortening of the beak corresponds with a longer base of the perigynium.

The absence of scurf and the lighter color of the achenes places all of our material cited above in *C. abdita* (i. e., *C. umbellata sensu* Mackenzie), rather than in *C. umbellata* Schkuhr (i. e., *C. rugosperma sensu* Mackenzie). The shape of the achenes as given by Mackenzie (*op. cit.*) is not of particular assistance, because we have not only seen achenes in *C. umbellata* which are "oblong-obovoid" as Mackenzie describes them, but also those which are "orbicular-obovoid," a characteristic which Mackenzie restricts to *C. abdita*. In our plants the perigynia are not over 3.2 mm. long which puts them at the upper limit of *C. abdita* and at the lower limit of *C. umbellata*, as these are described by Mackenzie (N. A. Fl. 18: 204-205).

C. TONSA (Fernald) Bicknell *cf.* Fernald, RHODORA 44: 289. Sea Gull Lake, L 3618.—In crevices of rocks.

C. PEDUNCULATA Muhlen. Poplar Lake, D 38.

C. AUREA Nutt. Sea Gull Lake, L 3658; Grand Portage, BA 1025; Temperance River, SS 12040; Schroeder, BA 1062, L 6404, O 985.—Cedar bog, disturbed ground along roadsides and roadside ditch; infrequent.

C. CRINITA Lam. Leo Lake, BR 6336.—Moist woods near lake shore.

C. AQUATILIS Wahl. Grand Marais, F. F. Wood 1, L. S. Cheney (June 29, 1891); Grand Portage, R 7898.—Swampy area.

C. AQUATILIS, var. *ALTIOR* (Rydb.) Fernald. *C. substricta* (Kükenthal) Mackenzie. South Fowl Lake, L. S. Cheney 40.

C. LENTICULARIS Michx. Loon Lake, L 3720; Moss Lake, D 130; South Fowl Lake, BBsH 297; Morrison Bay, BBs 722; Susie Island, R 6049; Lucille Island, BAA 353; Long Island, AA 532; Grand Marais, BR 4658.—Beaches, moist pockets in rocks, stream banks.

C. STRICTA Lam. Clearwater Lake, BsH 154.—Moist, open portage trail.

C. MEDIA R. Br. cf. Fernald, RHODORA 44: 304. *C. VahlII* Schkuhr, var. *inferalpina* (Wahlenb.) Fernald, RHODORA 35: 398. *C. Halleri* of authors. Watab Lake, BA 215; Pigeon Point, BR 6249, BAA 436, BBs 742; Lucille Island, BAA 347, OO 1086; Long Island, AA 550; Grand Marais, BR 4645, BR 4651, Butters and Wherry (June 28, 1935); Carribeau River, BR 4509, BR 4510; Temperance River, B. Juni (1878); Schroeder, BA 1083, L 6434, L 6419.—Moist woods and meadows; occasional. Except for the specimens cited above this species is represented from Minnesota in the Herbarium of the University of Minnesota only from Lake County.

While Fernald (RHODORA 35: 223 and Gray's Manual, ed. 8, p. 344) gives the lower limit of plant size in this as 1.5 dm., some of our specimens are but 1 dm. in height. The granulation of the perigynium in our material is extremely variable and in some cases as great as in *C. norvegica* Retz. (*C. VahlII*, var. *typica* Fernald). Furthermore the shape of the perigynium varies greatly even in the same plant. In general, however, the perigynium is not sharply triangular in contrast with the Scandinavian material of *C. norvegica* and that has led us to place our material in *C. media*. Unlike *C. media* var. *Steveni* (Holm) Fernald our material has the heads closely approximated.

C. BUXBAUMII Wahl. Sea Gull Lake, L 3644; Little Brick Island, OS 1083; Schroeder, BA 1072.—Lake shore, roadside ditch, and wet soil.

C. LIMOSA L. Grand Marais, L. S. Cheney 31.

C. PAUPERCULA Michx. (typical). Lake Saganaga, F. F. Wood 8; Porcupine Island, AA 577, OO 1018; Susie Island, OO 1024; Long Island, AA 528, OS 1113; Grand Marais, L. S. Cheney 37.—Rocky shores. The typical state of this species is characteristically northern in Minnesota.

C. PAUPERCULA Michx., var. *PALLENS* Fernald, RHODORA 8: 77. Sea Gull Lake, L 3658; Birch Lake, BA 827.—Portages and sphagnum bogs.

C. HOUGHTONIANA Torr. ex Dewey, Amer. Jour. Sci., ser. 1, 30: 63. 1836. "*C. Houghtonii*" cf. Mackenzie, N. A. Fl. 18: 328; Fernald, Gray's

Manual, ed. 8, p. 349. Sea Gull Lake, L 3641, BA 920; Gunflint Lake, F. F. Wood 18; North Lake, D. Lange 3; Poplar Lake, R 5438; Birch Lake, BA 819; MacFarland Lake, BBl 328; North Fowl Lake, BABs 675 & 704; South Fowl Lake, BM 10834; Grand Portage, R 5982, Be 667; Grand Marais, L. S. Cheney 32, BA 763; Carribeau River, BR 4511; Tofte, BR 4468, NBr 3158; Thunder Bay Dist., Ont. (North Fowl Lake), BABs 681.—Hillsides, clearings, roadsides, talus slopes, gravel pits, cliffs; common. The specific epithet as cited above is undoubtedly a valid publication in spite of Torrey's criticism as supported by Mackenzie (*loc. cit.*).

C. LASIOCARPA Ehrh., var. *AMERICANA* Fernald, RHODORA 44: 304. *C. filiformis* of authors. Gunflint Lake, D. Lange (June 28, 1917); Moose Lake, L. S. Cheney 25; Grand Portage, BA 971.—Portage trails, in water along pond and lake shores.

C. GRACILLIMA Schw. Grand Portage, BM 10873, BA 1050, SS 12019; Carribeau River, BR 4514.—Moist meadows and portage trails.

C. CASTANEA Wahl. Sea Gull Lake, L 3702.—Portage.

C. ARCTATA Boott. Gunflint Lake, R 5452; Poplar Lake, D 85; Clearwater Lake, BA 71; Mountain Lake, BBsH 64; East Pike Lake, BsH 212; South Fowl Lake, BsH 259; Mount Josephine, NE 2054; Mineral Center, BR 4580; Schroeder, NBr 3196.—Cliffs, talus slopes, portage trails, dry pine woods on hill-tops; general.

C. LIVIDA (Wahl.) Willd. Grand Portage, BR 6297A; Schroeder, BA 1059, L 6400, L 6431.—Border of pond in cedar woods, roadside ditch. One other collection from Minnesota (Lake County) is represented in the Herbarium of the University of Minnesota (B. Juni, Gooseberry Point, 1878).

C. VAGINATA Tausch. *C. saltuensis* L. H. Bailey. Birch Lake, BA 832; Grand Portage, R 6006.—Hummocks of sphagnum in spruce woods.

C. ORMOSTACHYA Wiegand, RHODORA 24: 196. Clearwater Lake, BsH 157.—Portage trail in moist soil; rare. Concerning this specimen the late Professor K. M. Wiegand says (*in lit.* Jan. 12, 1939) he "would identify [this] *Carex* as *C. ormostachya*. It agrees in all essential details. In addition to the Eagle Harbor and Porcupine Mts. specimens noted in my paper, I have had one from Douglas Lake. I judge, therefore, that the species occurs more generally than has been supposed around the Lake Superior region and vicinity." First record from Minnesota.

C. LEPTONERVIA (Fernald) Fernald, RHODORA 16: 214. Poplar Lake, D 42; South Fowl Lake, BABs 637; Hovland, BR 4632; Carribeau River, BR 4515.—Moist meadows and woods.

C. FLAVA L., var. *FERTILIS* Peck. *C. cryptolepis* Mackenzie. Lake Saganaga, L. S. Cheney 44 (in part); Sea Gull Lake, L 3649; East Bearskin Lake, BBl 475; West Pike Lake, BsH 172; Schroeder, L 6430.—Muddy and rocky lake shores and in swampy ground.

C. VIRIDULA Michx. *C. Oederi* Retz., var. *pumila* (Coss. & Germ.) Fernald, RHODORA 8: 201; *ibid* 35: 231. Lake Saganaga, L. S. Cheney 44 (in part); Grand Portage, BR 6297.—Pond and lake margins. Achenes

in our material are a little larger than they are in Pl. Exsicc. Gray. No. 168, and ours, in nearly mature examples, tend to have the edges of the achene pale while the rest is darker.

C. PAUCIFLORA Lightf. Sea Gull Lake, L 3696.—Sphagnum bog.

C. HYSTRICINA Muhl. Schroeder, L 3729, BA 1069.—Roadside ditch.

C. MICHAUXIANA Boeckl. Schroeder, BA 1086, L 6401.—Roadside ditch.

C. INTUMESCENS Rudge, var. *FERNALDII* L. H. Bailey. Sea Gull Lake, L 3672, L 3700; Cross River, BBl 390, BR (Aug. 20, 1934); Poplar Lake, L. W. Orr 18; Partridge Lake, D 189; Rove Lake, BA 105, BBsH 101; Mountain Lake, BAA 272; Lily Lake, BBsH 75; South Fowl Lake, BABs 638; Grand Portage, SS 12021; Mineral Center, BR 4591; Carribeau River, BR 4513.—Moist meadows, along trails, moist thickets; common. Mackenzie (N. A. Fl. 18) does not recognize this northern variety with its more narrowly ovate-lanceolate perigynia as distinct from the "fatter"-fruited southern material. Our specimens, however, definitely are the northern extreme.

C. RETRORSA Schw. Gunflint Lake, BR 6386; Clearwater Lake, BBl 437; Alder Lake, BsH 386; Grand Portage, R 7905; Cascade River, C. B. Reif A 26; Schroeder, OS 990.—Moist shores and banks.

C. RETRORSA, var. *ROBINSONII* Fernald, RHODORA 8: 201. Sea Gull Lake, L 3683; South Fowl Lake, BsH 300.—Beaches and streams.

While this variety is ignored by Mackenzie (N. A. Fl. 18), by Kükenthal (Pflznrch. IV. 20), and more recently by Fernald in Gray's Manual, ed. 8 (p. 378), our material fits best in this entity of Maine and Quebec because of the markedly short (*ca.* 5–6 mm. long) and relatively narrow (*ca.* 2 mm. wide) perigynia, and slightly shorter achenes (*ca.* $2\frac{1}{4} \times 1\frac{1}{4}$ mm.) which gives them a less oblong form. The perigynia and achenes have exactly the same texture as typical material of the species. The spikes are 1.3 cm. thick which comes within Fernald's description of the variety. In some plants the spikes are all clustered at the top, while in others a long-peduncled, single basal spike is more remote.

C. ROSTRATA Stokes, var. *UTRICULATA* (Boott) Bailey. *C. inflata* Huds., var. *utriculata* (Boott) Druce *cf.* Fernald, RHODORA 44: 329, and RHODORA 48: 145–146. Lake Saganaga, L. S. Cheney (July 23, 1891); Sea-gull River, BA 937; Sea Gull Lake, L 3684; Loon Lake, C. B. Reif A27; Mountain Lake, BBsH 91; West Pike Lake, BsH 183; Grand Portage, SS A5307a.—Along streams and in shallow water.

C. VESICARIA L. Loon Lake, BR 6515; South Fowl Lake, BABs 643.—Sloughs and stream beds.

ARACEAE

ARISAEMA ATRORUBENS (Ait.) Blume. *cf.* Fernald, RHODORA 42: 252. Cross River (near Gunflint Lake), BR 6370; Mountain Lake, BBsH 146; Mineral Center, BR 4586.—Moist woods, including sugar bush; all over the wooded part of the state, but relatively uncommon in Cook County, tending to be associated with other more southern species. Hood of BR 4586 is solid purple.

CALLA PALUSTRIS L. Kelso River, Bg 112; Gunflint Lake, SS 6009; Poplar Lake, Bg (photograph, 1943); Aspen Lake, BA 958; Brule River, BR 4522; Grand Marais, BA 978.—Ponds and marshes; local but usually abundant where it occurs. Reported by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134) as at Cross River.

ACORUS CALAMUS L. Loon Lake, C. B. Reif A17.—Very scarce. Reported by Smith and Moyle (*loc. cit.*) as at Kadunce Creek.

LEMNACEAE

LEMNA MINOR L. Reported by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134) as in Kadunce Creek.

ERIOCAULACEAE

ERIOCAULON SEPTANGULARE With. Saganaga Lake, N 1682; Sawbill Lake, Bg 111; Aspen Lake, U. S. F. S. (Sept. 1936); East Bearskin Lake, BBl 474.—Mucky and clayey soil; rare.

JUNCACEAE¹²

JUNCUS BUFONIUS L. Greenwood Lake, BA 983; Grand Portage, R 5980.—Gravel pit, roadside.

J. TENUIS Willd., f. *WILLIAMSI* (Fern.) Hermann, Castanea 10: 23. Clearwater Lake, BsH 152; Greenwood Lake, BA 985; Thunder Bay Dist., Ont. (Mountain Lake), BAA 313.—Gravel pits, portage trails.

J. TENUIS, var. *MULTICORNIS* E. Mey. Seagull Lake, BA 932 (*fide* S. C. W., approaching f. *Williamsii*); Hungry Jack Lake, BR 6344 (*fide* S. C. W.); Mountain Lake, BBsH 92 (*fide* S. C. W.); Grand Portage, Be 486 (*fide* S. C. W.).—Portage trails, gravel pits, dock sides.

J. TENUIS, var. *DUDLEYI* (Wieg.) Hermann, Jour. Arn. Arb. 25: 56. (1944). *J. Dudleyi* Wieg. Saganaga Lake, N 1684a (*fide* S. C. W.); Schroeder, BA 1076.—Moist ground.

J. VASEYI Engelm. Grand Portage, B (Sept. 15, 1929); Tofte, R 7819.—Meadow, edge of thicket; infrequent.

J. FILIFORMIS L. Sea Gull Lake, BR 6522; South Fowl Lake, BsH 299.—Rubble beaches, etc.

J. EFFUSUS L., var. *DECIPIENS* Buchen. cf. Fernald & Wiegand, RHODORA 12: 87. Hungry Jack Lake, BR 6343a.—Lake shore. This is the first record from the state in the Herbarium of the University of Minnesota.

J. EFFUSUS, var. *PYLAEI* (Laharpe) Fernald & Wiegand, RHODORA 12: 92. Lake Saganaga, BA 934; Cross River, BR 6376; Hungry Jack Lake, BR 6343b.—Wet river banks and lake shores.

J. NODOSUS L. Schroeder, BA 1081, OO 996.—Roadside ditch. Reported from Kadunce Creek by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134).

J. BREVICAUDATUS (Engelm.) Fernald, RHODORA 6: 35. Sea Gull Lake, BA 921; Loon Lake, BR 6520; Poplar Lake, R 5445; Hungry Jack Lake,

¹² Mr. S. C. Wadmond has kindly checked each of these identifications (with the exception of R 7819). His changes in determinations are indicated as "*fide* S. C. W."

BR 6348, BR 6351; Leo Lake, BR 6340; Greenwood Lake, BA 982; Porcupine Island, BR 6243, OO 1052; Susie Island, R 6050; Long Island, AA 530, AA 531; Grand Portage, BR 6295; Grand Marais, R 5961a; Lutsen, BR 6862; Schroeder, BA 1070, BA 1075 (*fide* S. C. W.), O 987.—Pond margins, stream beds, etc.; abundant. BR 6295 has rather long, narrow fruits which look somewhat unlike the majority of specimens.

J. ALPINUS Vill., var. *RARIFLORUS* Hartm. Greenwood Lake, BA 984.—Gravel pit.

J. PELOCARPUS Mey. Saganaga Lake, N 1684.—Wet, clay soil. The specimen is viviparous in part, as is often the case in this species.

LUZULA ACUMINATA Raf. *L. saltuensis* Fernald. Tucker Lake, D 185; Pigeon River, BR 4614.—Low moist places.

L. PARVIFLORA (Ehrh.) Desv. *L. parviflora*, var. *melanocarpa* (Michx.) Buchenau. Grand Marais, L. S. Cheney (July 26, 1891) Caribou Lake L 7247.—These appear to be the only collections from Minnesota, except for one made by Lakela (no. 4622) near Little Marais in nearby Lake County.

L. MULTIFOLRA (Retz.) Lej. Loon Lake, D 164.—Roadside.

LILIACEAE

TOFIELDIA PUSILLA (Michx.) Pers. *T. palustris* Gray's Man. ed. 7. Grand Marais, L. S. Cheney (July 20, 1891), BR 4642, N. L. Huff (July 9, 1925).—On moist rocks near lake shore. It is otherwise represented from Minnesota in the Herbarium of the University of Minnesota only from Two Harbors where it was collected by J. H. Sandberg, July 1891.

ALLIUM STELLATUM Fraser. Schroeder, BA 1079, BA 1079a.—Road cut. BA 1079a is a teratological form in which the flower is whitish, the pistil replaced by a vegetative bud.

A. SCHOENOPRASUM L., var. *SIBIRICUM* (L.) Hartm. *cf.* Fernald, RHODORA 28: 167. Pigeon Point, BR 6278; Clark's Bay, BAA 411; Susie Island, OS 1033, OO 1120; Thunder Bay Dist., Ont. (North Fowl Lake), BABs 690.—Cliffs and sterile slopes and basaltic ledges; rare.

The collections listed above and material from Isle Royale, Mich., Lake and Carleton Cos. Minn., are more or less intermediate between *A. Schoenoprasum*, var. *sibiricum* and *A. Schoenoprasum* var. *laurentianum* Fernald (*loc. cit.*) as Fernald characterizes these two varieties. Fernald describes the perianth as 10–14 mm. long in var. *sibiricum* and 8–10 mm. long in var. *laurentianum*,—ours being 7.5–12 mm.; the perianth segments of var. *sibiricum* “usually—more attenuate,” of var. *laurentianum* as “less attenuate,”—ours are more or less attenuate!; the color of the perianth in var. *sibiricum* as “commonly paler (though sometimes intensely colored),” in var. *laurentianum* as “intensely colored,”—ours are intensely colored. Fernald distinguishes between the two varieties also with respect to the width of umbel which he describes in var. *sibiricum* as 3.5–5 cm. in diam. in well-developed flowering specimens, and as 2.3–3 (rarely –3.3) cm. in var. *laurentianum*—ours range from 2.8 to 3.6 cm. and average ca. 3.2 cm. Our material seems effectually to fill the gap

between the older variety and the newer one, and we are therefore applying to it the name of the older variety whose concept should perhaps be emended to include var. *laurentianum*.

LILIUM PHILADELPHICUM L., var. ANDINUM (Nutt.) Ker. Long Island, BAA 465, AA 506; OS 1116; Grand Portage, BA 207; Mount Josephine, NE 2326; Temperance River, SS 6037; Thunder Bay Dist., Ont. (North Fowl Lake) BABs 695.—Open wooded areas and open rocky areas; local and rare.

There is much variation in the material from Long Island (BAA 465), both in color of the perianth which ranges from dark red to orange, as well as in the width of the perianth segments. This is rather significant because the population is a very small one on this island and it would be expected that if it had survived *in situ* for any large number of generations it would have achieved a higher degree of homozygosity than seems to be expressed morphologically. NE 2326 resembles typical material in its broader leaves which are present in two whorls instead of one.

CLINTONIA BOREALIS (Ait.) Raf. Sea Gull Lake, L 3620; Poplar Lake, L. W. Orr 10, L. W. Orr 24, D 14, D 75; South Fowl Lake, BABs 626; Clark's Bay, BBs 717; Grand Portage, Be 488, S. Brown 14.—In birch, spruce and jack pine woods; ubiquitous.

SMILACINA RACEMOSA (L.) Desf. Mineral Center, BR 4587.—Sugar bush; rare.

S. TRIFOLIA (L.) Desf. Sea Gull Lake, L 3662 & 3670; Poplar Lake, D 64; Caribou Lake, BA 130; Pigeon River, BR 4556; Grand Portage, R 6004, Be 690, S. Brown 40, BA 972; Brule River, L. S. Cheney (July 2, 1891).—In sphagnum of cedar bogs, spruce woods and tamarack woods; locally abundant.

MAIANTHEMUM CANADENSE Desf. (typical). Sea Gull Lake, L 3611; Tucker Lake, D 183; Poplar Lake, L. W. Orr 12, L. W. Orr 23, E. Loula 22, D 53; South Fowl Lake, BABs 617; Pigeon Point, BAA 438; Clark's Bay, BBs 718; Morrison Bay, BBl 362; Grand Portage, Be 529 & 699, R 6013, Butters & Wherry (June 30, 1935), S. Brown (1935), BA 208; Brule River, BR 4551; Grand Marais, L. S. Cheney (June 20, 1891); Carribeau River, BR 4507.—Trails, coniferous woods, etc.; general.

M. CANADENSE, var. INTERIUS Fernald, RHODORA 16: 211. cf. also Butters, Minn. Studies Pl. Sci. 1: 437. Mineral Center, BR 4594, BA 192.—Hard maple forest—this is the only locality in which this variety has been found in Cook County.

STREPTOPUS AMPLEXIFOLIUS (L.) DC., var. AMERICANUS Schultes. cf. Fassett, RHODORA 37: 98. Kimball Creek, R 2616; Carribeau River, BR 4498.—Shady places; infrequent.

S. AMPLEXIFOLIUS, var. DENTICULATUS Fassett, RHODORA 37: 98. Mountain Lake, BBsH 138; Grand Portage, Be 537, Be 635; Temperance River, L 4793.—Moist woods; infrequent.

S. ROSEUS Michx., var. LONGIPES (Fern.) Fassett, RHODORA 37: 110. Sawbill Lake, Bg 109; Poplar Lake, L. W. Orr 1, BA 824; Clearwater Lake, BBl 420; Clark's Bay, BBs 715; Grand Portage, Be 556, S. Brown 5;

Grand Marais, F. F. Wood (June 20, 1891), L. S. Cheney (June 20, 1891).—Moist woods, birch, birch-aspen, etc.; ubiquitous.

POLYGONATUM pubescens (Willd.) Pursh. Mineral Center, BR 4592, BA 191.—Hard maple forest, the only locality in Cook Co. where this species has been found.

TRILLIUM CERNUUM L., var. *MACRANTHUM* Wieg. Sawbill Lake, Bg 110; Poplar Lake, D 24, D 68; South Fowl Lake, BABs 635; Pigeon River, BR 4617; Grand Portage, S. Brown 11; Mineral Center, BA 218.—Tends to occur in hardwood forest; rare. Mr. D. M. Stewart reports "*T. cernuum*" from just west of Lima Mountain.

IRIDACEAE

SISYRINCHIUM MONTANUM Greene, var. *CREBRUM* Fernald, *RHODORA* 48: 159. *S. angustifolium* of Gray's Man., ed. 7. Clearwater Lake, D 110; Clark's Bay, BAA 410; Grand Portage, Be 472, BBl 363, Butters & Wherry (June 30, 1935), S. Brown 19, BA 206, BA 1028, SS 12018a; Grand Marais, L. S. Cheney (June 27, 1891); Schroeder, BA 1077, OS 989.—Sterile slopes, road banks, old roads, meadows; infrequent. BBl 363 has inflorescences which branch in two of the seven plants collected. This character as well as the darker color of the dried plants suggests *S. angustifolium* Mill. (there is a tendency for *S. angustifolium* to brown slightly on drying as contrasted with the usually fresh-looking green of *S. montanum* var. *crebrum*). Its spathes, on the other hand, are quite definitely like *S. montanum* var. *crebrum*. Since Miss Lakela has found material (L 5353) in Duluth which very closely resembles (except that the seeds are not quite spherical) *S. angustifolium*, it is not impossible that *S. angustifolium* occurs elsewhere on the shores of Lake Superior and thus may have hybridized with the ubiquitous *S. montanum* var. *crebrum* to produce the occasional intermediate type of individual represented by BBl 363. Perhaps the fact that the seeds of BBl 363 are abortive lends further support to this conjecture.

IRIS VERSICOLOR L. Sea Gull Lake, L 3634; Sawbill Lake, Bg 108; Round Lake, C. B. Reif A9; Gunflint Lake, BBl 382; Lily Lake, BBsH 73; South Fowl Lake, BABs 632; Pigeon Point, N 1642; Little Brick Island, OS 1082; Susie Island, R 6032b; Grand Portage, S. Brown 29; Brule River, C. B. Reif (July 10, 1936); Temperance River, C. B. Reif A12; Thunder Bay Dist., Ont. (Mountain Lake), BAA 323a.—Lake shores, moist woods, swales; general, but not very abundant. Reported from Cross River by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134).

ORCHIDACEAE

CYPRIPEDIUM ARIETINUM R. Br. Gunflint Lake, Holzinger (June 17, 1897).—Very rare.

C. CALCEOLUS L., var. *PARVIFLORUM* (Salisb.) Fernald, *RHODORA* 48: 4. *C. parviflorum* Salisb. Sea Gull Lake, L 3660.—Cedar bog; very rare; not indicated by Fuller (Bull. Publ. Mus. City of Milwaukee 14: 67) as seen from Cook Co. or the Arrowhead country in general.

C. *ACAULE* Ait. Sea Gull Lake, L 3621; Poplar Lake, BA 211; Partridge Lake, D 188; Clearwater Lake, N 1698; Wauswaugoning Bay, NE 2324; Brule River, BR 4504.—Abundant.

HABENARIA VIRIDIS (L.) R. Br., var. *BRACTEATA* (Muhl.) A. Gray. North Fowl Lake, BAs 662; Pigeon River, BR 4621; Grand Portage, Be 523, Be 559, R 6069, S. Brown 34, BM 10872, BA 1021; Mount Josephine, NE 2331, BA 180; Carlton Peak, T. S. Roberts (Aug. 25, 1879).—Old trails, shady woods, roadsides; general.

H. *HYPERBOREA* (L.) R. Br., var. *HURONENSIS* (Nutt.) Farw. Sea Gull Lake, L 3651; Grand Portage, BA 217, S. Brown (1937), R 7892; Tofte, L 4701, R 7826; Cross River (?), L 3722; Temperance River, SS 6070.—Sphagnous cedar bogs, swampy roadsides, moist ditches; infrequent. This is not reported from Cook County by Fuller (*op. cit.*, p. 85).

H. *DILATATA* (Pursh) Hook. Alton Lake, Winslow Briggs (Sept. 8, 1951); Grand Portage, BM 10875.—Spruce-tamarack and cedar swamps; rare. Not reported from Cook Co. by Fuller (*op. cit.*, p. 86.).

H. *HOOKERI* Torr. Sawbill Lake, Bg 102; Sea Gull Lake, L 3622, L 3679, Winslow Briggs (Sept. 8, 1951); Granite River, L. S. Cheney (Jul. 22, 1891); Birch Lake, D 61; Tucker Lake, D 182; South Lake, D 780.—Moist woods; occasional.

H. *ORBICULATA* (Pursh) Torr. Sea Gull Lake, L 3661; Sawbill Lake, Bg 98; Poplar Lake, L. W. Orr 2; Partridge Lake, BA 778; Rove Lake, F. F. Wood (Jul. 13, 1891); Mineral Center, BR 4584; Devil's Track River, T. S. Roberts (Aug. 21, 1879).—Moist woods; occasional.

H. *OBTUSATA* (Pursh) Richards. Sea Gull Lake, L 3625; Sawbill Lake, Bg 100; Gunflint Lake, L 3719, SS 6012; Birch Lake, BA 777; Royal Lake, BM 10858; Pigeon River, BR 4555; Susie Island, OO 1135; Grand Portage, L. S. Cheney (July 4, 1891), R 5985, S. Brown 32, BM 10877; Hovland, Be 619; Devil's Track River, C. W. Hall (Aug. 21, 1879); Grand Marais, T. S. Roberts (Jul. 30, 1879), MacMillan Brand & Lyon 49, N. L. Huff (Jul. 10, 1925), BA 769.—Moist woods; common.

H. *PSYCODES* (L.) Spreng. Jasper Lake, Winslow Briggs (Sept. 8, 1951).—Portage; rare. Winslow Briggs also reports this as seen Aug. 28, 1950 on the portage between Mueller Lake and Ogishke Muncie Lake in Lake County.

POGONIA OPHIOGLOSSOIDES (L.) Ker. Sawbill Lake, Bg 106.—Rare—first record in Herbarium of the University of Minnesota from Cook County.

ARETHUSA BULBOSA L. Kelso River, Bg (Jul. 2, 1946).—Rare—first record in the Herbarium of the University of Minnesota from Cook County.

SPIRANTHES GRACILIS (Bigel.) Beck. Sea Gull Lake, BA 917; Sawbill Lake, Bg 107; Otter Lake, BA 793; Lima Mountain, BA 861; Grand Marais, BA 770.—Pine woods and mixed woods; infrequent.

S. *ROMANZOFFIANA* Cham. Sawbill Lake, Bg 104; Kelso Mountain, Bg 105; Grand Portage, BR 6292, S A5302; Tofte, R 7827, R 7848.—Cedar swamp, roadside; rare.

Not shown from Cook Co. by Fuller (*op. cit.*, p. 114).

GOODYERA REPENS (L.) R. Br., var. *OPHIOIDES* Fernald. Sawbill Lake, Bg 11, Bg 101; Birch Lake, BA 831a; Rove Lake, L. S. Cheney (July 16, 1891), BBl 424; Clearwater Lake, BBl 457; Mountain Lake, BBsH 142; Pigeon Point, S 6008; Clark's Bay, BR 6224, N 1618, AA 584a; Susie Island, R 6059, OO 1020; Lucille Island, BAA 372; Grand Portage, R 6009, BA 977; Grand Marais, T. S. Roberts (Jul. 30, 1879), MacMillan Brand & Lyon 50, H. L. Lyon 920, H. L. Lyon 935, BA 771; Temperance River, OO 998; Cascade River, T. S. Roberts (Aug. 2, 1879).—Moist woods; common.

G. TESSELATA Lodd. Sea Gull Lake, L 3623, Winslow Briggs (Sept. 8, 1951); Gunflint Lake, BR (Aug. 1934); Birch Lake, BA 831; Lima Mountain, BA 863; Royal Lake, BM 10856.—Moist woods; infrequent. L 3623 is too young for accurate determination, but probably belongs here.

LISTERA CORDATA (L.) R. Br. Sawbill Lake, Bg 9, Bg 10; Sea Gull Lake, L 3663; Gunflint Lake, L 3718, SS 6011; Royal Lake, BM 10857; Pigeon River, BR 4554; Clark's Bay, BBs 719; Susie Island, R 6060, OO 1134; Lucille Island, BAA 353; Grand Portage, S. Brown 33, BM 10876; Reservation River, L. S. Cheney (Jul. 4, 1891).—Moist woods; occasional.

L. AURICULATA Wiegand. Grand Portage, R 6026b; Grand Marais, L. S. Cheney (Jul. 23, 1891).—Moist woods; very scarce—these are the only records for Minnesota other than for Duluth (Lakela 6010).

L. CONVALLARIOIDES (Sw.) Nutt. Mineral Center, BR 4576.—Cedar-spruce-balsam forest; very scarce. Immature; only record for Minnesota in the University of Minnesota Herbarium.

CORALLORHIZA TRIFIDA Chatel. Sea Gull Lake, L 3659; Sawbill Lake, Bg 8; Gunflint Lake, SS 6016; North Lake, D. Lange 7; Poplar Lake, D 52, D 52a; Tucker Lake, D 179; Moss Lake, D 133; Clearwater Lake, BA 91, D 124; Mountain Lake, BBsH 147; John Lake, BM 10805; MacFarland Lake, BBl 342; North Fowl Lake, BABs 663; Royal Lake, BM 10854; Pigeon River, BR 4620; Grand Portage, Butters & Wherry (June 29, 1935); Carribeau River, BR 4512.—Moist woods; very common.

C. MACULATA Raf. Sea Gull Lake, L 3624; Sawbill Lake, Bg 7, Bg 106; Gunflint Lake, BBl 386, L 3716; Watab Lake, BAA 315, BBsH 15; Clearwater Lake, BA 122; Mountain Lake, BAA 309; John Lake, BM 10780; Clark's Bay, NE 2330; Susie Island, OO 1133; Grand Portage, BBl 345, S. Brown 26 & 35; Mount Josephine, NE 2327, BA 173; Mineral Center, BR 4600.—Moist woods; common.

C. MACULATA, f. *FLAVIDA* (Peck) Farwell. Poplar Lake, Bg (photograph, 1943); Mountain Lake, BAA 264; Temperance River, SS 6069.—Spruce-birch woods; infrequent. Flowers waxy-yellow with white lip.

C. STRIATA Lindl. Mount Josephine, NE 2329, S. Brown (1935).—Moist woods; more common than the number of collections would indicate. It is not cited from Cook County by Fuller (*op. cit.*, p. 139).

MICROSTYLIS UNIFOLIA (Michx.) B. S. P. *Malaxis unifolia* Michx. Kelso Mountain, Bg 103; Grand Portage, BM 10883; Tofte, L 4700; Temperance River, OS 1000; Schroeder, BA 1064.—Slate slopes, roadside ditch, grassy hill top; rare. While this species is often included in the

genus *Malaxis*, it has the ovaries of the flowers twisted only 180°, while in *Malaxis* proper the ovaries are twisted 360°. This would seem to justify maintaining the genera as distinct. Not recorded from Cook Co. by Fuller (*op. cit.*, p. 126).

LIPARIS LOESELII (L.) Richard. Schroeder, BA 1074.—Roadside ditch; very rare. First record in University of Minnesota Herbarium for Cook County.

CALYPSO BULBOSA (L.) Oakes. Sea Gull Lake, Jim Dunn (L 3680); South Lake, BA 782, D 190; Black Point, T. S. Roberts (Aug. 24, 1879).—Mossy woods; very rare.

SALICACEAE

SALIX PYRIFOLIA Anderss. Sea Gull Lake, N 1669, N 1675, Poplar Lake, R 5436, D 2, D 30, D 79, D 81; Birch Lake, D 73; Moss Lake, D 131; South Fowl Lake, BABs 642; Sailboat Island, AA 536a; Grand Portage, BR 6308; Grand Marais, Butters & Wherry (June 28, 1935), BA 41.—Sloughs, pond margins, jack pine woods; common.

S. BEBBIANA Sarg. Poplar Lake, D 82; Loon Lake, D 170, D 171, D 174, D 177, D 178; South Fowl Lake, BABs 651; Porcupine Island, AA 578; Sailboat Island, AA 536; Grand Portage, Be 471; Kimball Creek, R 2636; Grand Marais, BA 36, BR 6908, BM 10763, BM 10777; Tofte, BR 4475.—Beaches, old trails and roads.

S. PEDICELLARIS Pursh, var. HYPOGLAUCA Fernald. Sea Gull Lake, BA 905; Brule River, H. F. Olson 2.—Muskeg and wet meadow; infrequent.

S. DISCOLOR Muhl. Poplar Lake, D 11, D 21, D 39, D 44, D 67a; Grand Portage, R 6005, Be 610, Be 676, R 6023, R 7890, R 7891; Grand Marais, BM 10764.—Swamp margins, moist trails, pond margins; common.

S. DISCOLOR, var. LATIFOLIA Anderss. *S. discolor*, var. *eriocephala* of Gray's Man., ed. 7. Grand Portage, R 6012, R 6015; Mount Josephine, BR 6313, BR 6315; Grand Marais, BA 45.—Roadsides, hill tops.

S. HUMILIS Marsh. Poplar Lake, L. W. Orr 30; Grand Portage, Be 547; Mount Josephine, BR 6314.—Portage trail, hill top.

S. GRACILIS Anderss. *S. petiolaris* J. E. Smith, var. *rosmarinoides* (Anderss.) Schneid. South Fowl Lake, BABs 648.—Beach.

S. PLANIFOLIA Pursh. Poplar Lake, D 78, D 80; Clark's Bay BR 6230; Porcupine Island, BR 6242; Susie Island, R 6048; Grand Portage, Be 651, Be 691, R 6021, BA 969; Brule River, BR 4521; Grand Marais, R 5967, BA 35, BA 43, BA 44, BR 6907, BR 6909.—Edge of woods by ponds and swamps, lake margin; infrequent. This species occurs in St. Louis, Lake of the Woods and Cook Counties in Minnesota as far as the collections in the Herbarium of the University of Minnesota would indicate.

S. BEBBIANA × S. PLANIFOLIA. Porcupine Island, BBs 744.—Crack in shore rocks. Both of the presumed parents grow on this island. This collection has pistils and fruits with the short styles of *S. Bebbiana*; the very young, as yet unfolded leaves have the dense pubescence of similar leaves of *S. Bebbiana*; very young leaves which have just unfolded are

reddish and rapidly become glabrescent like those of *S. planifolia*; the old leaves are not quite rugose enough for *S. Bebbiana*.

S. PELLITA Anderss. Grand Portage, BA 993.—Brookside thicket. Not previously represented from Minnesota in the Herbarium of the University of Minnesota, although it has been collected on Isle Royale by W. S. Cooper.

POPULUS TREMULOIDES Michx. Grand Portage, Be 527, Be 545.—Occurring sporadically throughout the county, especially in old burns and openings.

P. BALSAMIFERA L. Grand Portage, Be 468, Be 648.—Forming groves in various parts of the county, especially in the southern half where it is quite general.

MYRICACEAE

MYRICA GALE L. Sea Gull Lake, L 3606; Gunflint Lake, BR 6380; Poplar Lake, D 109; Birch Lake, D 72; Otter Lake, BA 795; South Fowl Lake, BABs 650; Clark's Bay, NBr 3218; Susie Island, R 6047, N 1654; Grand Portage, Be 704, BR 6306; Brule River, BR 4520; Temperance River, L 4711.—Bogs, beaches, lake shore; common to very abundant, although absent from some lake shores, while it may form a veritable hedge around others.

COMPTONIA PEREGRINA (L.) Coult. cf. *RHODORA* 40: 410. *Myrica asplenifolia* L.—We have not noted this species to date in Cook Co., although it is abundant in Lake and St. Louis counties immediately to the west. It is to be expected in the acidic portions of Cook Co.

CORYLACEAE

CORYLUS CORNUTA Marsh. Cross River, BBl 391; Grand Portage, Be 503; Mineral Center, Be 639; Grand Marais, R 2604; F. H. Anderson (1938); Thunder Bay Dist., Ont. (north side of Mountain Lake), BAA 311.—Forming thickets in white birch-black ash woods and *Pinus resinosa* forest.

BETULA LUTEA Michx. f. Mineral Center, Be 638.—Large trees in the isolated sugar-bush, mentioned in more detail under *Acer saccharum*. Also observed by BA at Mineral Center, and reported by D. M. Stewart near Hovland.

B. PAPHYRIFERA Marsh. Poplar Lake, R 5441, BR (Aug. 26, 1934); Pigeon Point, B (Sept. 3, 1927); Lucille Island, BAA 374; Grand Portage, BR 6261, BR 6262.—In spruce woods; abundant. The bark of BR 6261 is somewhat yellowish, but it is otherwise typical of the species.

B. CORDIFOLIA Regel. cf. C. O. Rosendahl, Jour. For. 26: 878. *B. papyrifera*, var. *cordifolia* (Regel) Fern. Poplar Lake, R 5440; Porcupine Island, BR 6260; Belle Rose Island, BR 6239; Susie Island, R 6041; Lucille Island, N 1653, BAA 357; Grand Portage, Be 485, Be 572, Be 587, Be 649, SS 12018; Devil's Track River, BR 4639; Grand Marais, R 2619; Schroeder, D. G. Schaal (Sept. 1938). This species in Minnesota is largely restricted to Cook Co.

Betula × *Rosendahlii*, hybr. nov.—*B. papyrifera* Marsh. × *B. cordifolia* Regel.

Arbor parva (ad 8 m. alta). Cortex fusco-albus vel brunneus, papyraceus vel asper. Rami obscure fusi vel nigri, ramuli juniores obscure luteo-rubri, dense glandulosi, minute villosuli. Foliarum laminae ovatae, basi cuneatae, apice acutae vel acuminatae, margines serrati vel biserrati, 5-7-costatae, supra glabrescentes et glandulosae, et in nervorum axillis pubescentes; petioli glabrescentes et glandulosi, 5-13 mm. longi. Inflorescentiae fructiferae cylindricae, 15-25 mm. longae, 5-8 mm. diam.; bracteae marginibus puberulis, lobo medio oblongo, lanceolato, obtuso, lobis lateralibus brevioribus, angulato-suborbicularibus. Nuculae late obovatae, apice puberulae, alatae, alae corporem in latitudinem aequantes, steriles.

Small tree (up to 8 m. tall), bark dull reddish white to very dark, papery to rough. Branchlets dull grayish to black, twigs dull yellowish-red, densely glandular, minutely villous. Leaf blades ovate, cuneate at the base, acute to acuminate at the apex, margins serrate to bi-serrate, 16-40 mm. wide \times 30-55 mm. long, 5-7 lateral veins, glabrescent and glandular above, slightly pubescent and glandular beneath with some pubescence in the axils of the vein branches; the glabrescent and glandular petioles 5-13 mm. long. Pistillate catkins cylindrical 15-25 mm. long, 5-8 mm. diam.; bracts with puberulous margins, the central lobe oblong lanceolate obtuse, lateral lobes shorter and angular suborbicular. Achenes broadly obovate, puberulous at apex, with wings as wide as the body of the nutlet, sterile. TYPE, *C. O. Rosendahl 6020*, Aug. 12, 1929, bark reddish. On the rocks south side of Grand Portage Island, Cook County, Minnesota (in Herb. Minn.). Other specimens seen (all in Herb. Minn.): *Butters, Abbe & Abbe 439*, July 13, 1937, bark dark and rough, tree about 20 feet high. Shingly beach, Little Portage Bay, Pigeon Point, Cook County, Minn. *Butters & Moore 10865*, July 4, 1939, hill back of Grand Portage, Cook Co., Minn.

In Cook County the ranges of *B. papyrifera* and of *B. cordifolia* overlap, providing an opportunity for hybridization in a genus notorious for this phenomenon (*cf., inter alia*, C. O. Rosendahl, Observations on *Betula* in Minnesota with special reference to some natural hybrids. Minn. Bot. Stud. 4: 443-459). The rather small-leaved birch described above is intermediate in a number of respects between the putative parents as represented in Cook County. Its leaves are rather densely glandular, as in *B. cordifolia*, rather than sparsely so, as in *B. papyrifera*. The base of the leaf on the other hand approaches the obtusely cuneate character of *B. papyrifera*, rather than the cordate to truncate type of base found in *B. cordifolia*. It resembles neither in the surprisingly microphyllous leaf. The central lobe of the pistillate scale is oblong-lanceolate, while that of *B. cordifolia* is oblong and that of *B. papyrifera* is more nearly acuminate; the lateral lobes are angular-suborbicular, while they are rounded in *B. papyrifera* and strongly ascending and narrowly triangular oblong in *B. cordifolia*. The poorly filled-out achenes are obovate, in contrast to their more or less elliptic outline in the two parental species; and the wings are of about the same width as the body of the achene, while in the parental species the wings are wider than in the hybrid. The bark is quite variable but tends to be darker than in the parental species.

B. PUMILA L., var. *GLANDULIFERA* Regel. Seagull Lake, BA 904; Kelso River, Bg 97, Bg 99, Bg (Sept. 1, 1946).—Muskeg, and floating

bog; locally abundant in the region of acid rocks, but never observed by us in the Rove slate area.

ALNUS CRISPA (Ait.) Pursh. Sea Gull Lake, L 3619; Sawbill Creek, D. G. Schaal (8-6-38); Poplar Lake, R 5442, D 1, D 84; Mountain Lake, BAA 276; North Fowl Lake, BABs 665; Pigeon Point, R 6070; Morrison's Bay, BBs 736; Lucille Island, BAA 375; Hat Point, Butters & Wherry (Jun. 30, 1935); Grand Portage, Be 553, Be 626; Brule River, BR 4544; Grand Marais, T. S. Roberts (Aug. 14, 1879), R 5970, BA 46; Carribeau River, BR 4486.—Common throughout the County.

A. RUGOSA (DuRoi) Spreng., var. *AMERICANA* (Regel) Fernald, *RHODORA* 47: 333. *A. incana* of Gray's Man., ed. 7. Pigeon Point, BR (Aug. 19, 1930); Grand Portage, Be 494; Schroeder, D. G. Schaal (10-14-38); Thunder Bay Dist., Ont. (Mountain Lake), BAA 324a.

BAA 324a is a microphyllous phase.

URTICACEAE

URTICA PROCERA Muhl. *U. gracilis* of Gray's Man., ed. 7. cf. Fernald, *RHODORA* 28: 195. Little Caribou Lake, BsH 415; Grand Portage, Be 683.—Cliffs and shore of Lake Superior.

SANTALACEAE

GEOCAULON LIVIDUM (Richards.) Fernald, *RHODORA* 30: 23. Pigeon River, BR 4560; Pigeon Point, BBl 731; island north of Little Susie Island, OO 1153; Sailboat Island, OO 1096; Grand Portage, R 6003.—In moss and sphagnum of cedar-spruce swamps; local and rare. The only other collections from the state represented in the Herbarium of the University of Minnesota were made by John W. and Marjorie F. Moore (10923) and by Elenore Colson (10983) in Lake of the Woods County in July, 1939.

ARISTOLOCHIACEAE

ASARUM CANADENSE L., var. *ACUMINATUM* Ashe. Cross River (near Sea Gull Lake), BBl 388; Pigeon River, BR 4619; Hovland, BR 4630; Kimball Creek, R 2618.

Predominantly southern in Minnesota, and spotty in its occurrence in the northern counties. Typical *A. canadense* occurs much less frequently than does var. *acuminatum*.

POLYGONACEAE

RUMEX MEXICANUS Meisn. Sawbill Trail, Bg 87.—Roadside.

R. CRISPUS L. John Lake, BsH 264.—Portage trail; general weed in Minnesota.

R. ACETOSELLA L. Grand Portage, Be 526, Be 615; Susie Island, OO 1040; Mount Josephine, NE 2052; Grand Marais, T. S. Roberts (Aug. 13, 1879).—Roadsides, etc.; common weed in the state.

POLYGONUM ERECTUM L. Clearwater Lake, BsH 425.—On a road; weed.

P. ACHOREUM Blake, RHODORA 19: 232. Grand Marais, H. W. Slack (July 1892).

P. AVICULARE L. Grand Portage, Be 633; Grand Marais, T. S. Roberts (Aug. 13, 1879).—Cultivated ground; roadsides.

P. DOUGLASII Greene. Clearwater Lake, N 1709.—On ledge of cliff. Fernald (RHODORA 37: 259) reports this species from Manitoulin Island, Ont., and Keweenaw Co., Mich. and says of its distribution "Local east of the Black Hills and the Rocky Mts. Already known from a few stations in Ontario and in Michigan from the islands of Lake Superior." It is primarily a western species represented in the Herbarium of the University of Minnesota from the Pacific Coast, the Rocky Mountains to Colorado, the Black Hills, Vermont (Eggleston), and in Minnesota from Lake of the Woods, St. Louis, Lake and Cook Counties.

P. VIVIPARUM L. Pigeon Point, BBI 361, BAA 437; Belle Rose Island, OO 1071; Lucille Island, BAA 346, OO 1089; Grand Marais, T. S. Roberts (Aug. 21, 1879), L. S. Cheney (June 27, 1891), Butters & Wherry (June 28, 1935).—Crevices of rocks near the shores of Lake Superior; rare. The specimens listed above are the only ones from the state represented in the Herbarium of the University of Minnesota.

P. NATANS (Michx.) Eaton, f. GENUINUM Stanford, RHODORA 27: 158. Sea Gull Lake, N 1666; Granite River, L. S. Cheney (Jul. 21, 1891), F. F. Wood (Jul. 21, 1891); Brule River, E. Loula 18.—Occurring primarily on muddy bottom of which there is little in Cook Co., and is therefore correspondingly infrequent; otherwise general in the state.

P. NATANS, f. HARTWRIGHTII (Gray) Stanford. P. amphibium L., var. stipulaceum (Coleman) Fernald. Sea Gull Lake, N 1666a.

P. LAPATHIFOLIUM L. Sawbill Lake, Bg 89.

P. SCABRUM Moench. Susie Island, OO 1027.—Edge of woods in wet soil among rocks.

P. HYDROPIPER L. Mineral Center, Be 640; Grand Portage, R 7906.—Hillside and moist roadside; weed. Be 640 is apparently the typical variety (the European weed) which Stanford (*loc. cit.*) gives as occurring in the East and in the West but not in the Middle West.

P. PERSICARIA L. Grand Marais, T. S. Roberts (Aug. 12, 1879).

P. CILINODE Michx. Sea Gull Lake, L 3703; Winchell Lake, BA 138; West Bearskin Lake, D 145; John Lake, BM 10788; North Fowl Lake, BABs 657; Grand Portage, Be 621; Mineral Center, BR 4566; Grand Marais, T. S. Roberts (Jul. 31, 1879); Sawbill Trail, Bg 88.—Cliffs, ridges, thickets; very common.

P. CONVULVUS L. Grand Portage, Be 562, Be 616; Grand Marais, T. S. Roberts (Aug. 13, 1879).—Cultivated ground, etc.

CHENOPODIACEAE

CHENOPODIUM HYBRIDUM L., var. GIGANTOSPERMUM (Aellen) Rouleau. Cross River, BA 927; Hungry Jack Lake, BsH 423; Rove Lake, BBsH 107; Watab Lake, BAA 234; Clearwater Lake, N 1693, BA 953; Mountain Lake, BBsH 44; West Pike Lake, BsH 176; East Pike Lake, BsH 230;

MacFarland Lake, BsH 373; Royal River, BsH 349; Royal Lake, BsH 249; Thunder Bay Dist., Ont. (Pigeon Bay), AA 603.—Native and general in the region.

C. ALBUM L. Clearwater Lake, N 1713, BA 952; Mountain Lake, BBsH 41; Grand Portage, Be 515, Be 687; Grand Marais, T. S. Roberts (Aug. 13, 1879).—Introduced weed.

C. CAPITATUM (L.) Aschers. Kimball Creek, BR 4662.—Roadside.

AIZOACEAE

MOLLUGO VERTICILLATA L. Poplar Lake, BA 835.—Introduced weed near habitations.

CARYOPHYLLACEAE

SAGINA NODOSA (L.) Fenzl. Pigeon Point, BR 6253, BAA 385, BAA 440, BBs 738; Susie Island, B (Sept. 2, 1927), OO 1151; Thunder Bay Dist., Ont. (the Boundary Islands, Pigeon Bay) AA 595.—Cracks in wave-washed shore rocks of Lake Superior; rare.

While this has long been known from Isle Royale and Isle St. Ignace, it has been represented from Minnesota in the Herbarium of the University of Minnesota only since it was collected in 1927 by the senior author on Susie Island near Grand Portage. It is decidedly local and seems to be wholly restricted to rocks constantly kept moist by the wash of the cold waters of Lake Superior.

ARENARIA MACROPHYLLA Hook. Rove Lake, BBsH 97; Watab Lake, BAA 325; Clearwater Lake, BsH 169; Mountain Lake, BBsH 87; South Fowl Lake, BsH 278; Royal River, BsH 357; Royal Lake, BsH 243, BM 10846; Thunder Bay District., Ont. (South Fowl Lake) BABs 710.—Cliffs and shoulders of cliffs; very local.

This was first collected in Minnesota by Mrs. Abbe and the writers in 1937 (Watab Lake), and was subsequently found in a number of localities in Cook County. It is the broad-leaved extreme, resembling some of the well-developed western material in the Herbarium of the University of Minnesota. It is an excellent match for Hooker, Flor. Bor. Amer., Pl. XXXVII, fig. B, especially in leaf-form (Hooker's var. β). While it is apparently a characteristic serpentine plant in the East and possibly so in the West, in Cook County it occurs primarily on the parched and loose soil of the disintegrating diabase of the diabase caps over the sedimentaries which together form the characteristic cliffs of northeastern Cook County.

STELLARIA MEDIA (L.) Cyril. Susie Island, BBl 346; (also noted by B at Grand Portage).—Wet soil near habitations; introduced.

S. LONGIFOLIA Muhl. *sens. lat.* MacFarland Lake, BBl 337; South Fowl Lake, BM 10850, BABs 619; Grand Portage, Be 573, Be 647, BAA 454; Hovland, BR 4577.—Moist ditches, swales and trails.

The Minnesota material falls into two series, a narrow-leaved group of plants with capsules more or less darkened, and a broader-leaved group with straw-colored capsules. The latter is typical *S. longifolia* and the former is perhaps a separate variety.

Some of our material (BBl 337, BR 4577, BAA 454, and BABs 619) has the petals shorter than the sepals, thus departing from the description

given by Fernald in Gray's Manual, ed. 8, p. 623, but otherwise agrees in having the broader leaves and straw-colored capsules of the typical phase. BM 10850 however has the petals longer than the sepals and thus more nearly agrees with Fernald's description in Gray's Manual, ed. 8.

Be 573 and Be 647 have the dark capsules and narrower leaves of the other entity mentioned. This also occurs elsewhere in Minnesota.

S. CALYCANTHA (Ledeb.) Bong. (typical) *cf.* Fernald, RHODORA 42: 255. West Bearskin Lake, BR 6364; Watab Lake, BAA 327; Susie Island, R 6043.—Moist portage trails and swales; rare.

S. CALYCANTHA, var. *FLORIBUNDA* (Fernald) Fernald, RHODORA 42: 255. Grand Portage, R 5990; Susie Island, OO 1037.—Rare in Minnesota.

CERASTIUM BEERINGIANUM Cham. & Schlecht. *cf.* Fernald & Wiegand, RHODORA 22: 169. Thunder Bay Dist., Ont. (North Fowl Lake), BABs 685.

While this has not yet been found in Cook County, the above locality on a slate cliff is immediately across the International Boundary from Minnesota, and it is to be expected that it will yet turn up on the Minnesota side of the boundary.

Fernald (Gray's Man., ed. 8, p. 626) gives the range of *C. beeringianum* as "Calcareous ledges and gravels, Lab. to w. Nfld. and Gaspé Pen. (ascending to 1000 m. alt.) and Rimouski Co., Que.; Alaska and Yuk. to Ariz." This is another of the notable range extensions that are associated with the sedimentaries of the Border Lakes.

C. VULGATUM L., var. *HIRSUTUM* Fries. Loon Lake, D 169; Carribeau River, BR 4516a.

C. VULGATUM, var. *HIRSUTUM*, f. *GLANDULOSUM* (Boenn.) Druce. Lima Mountain, BA 882.—Trail.

C. NUTANS Raf. North Lake, D. Lange 10.—Growing on an Indian camp ground.

LYCHNIS ALBA Mill. Susie Island, OO 1143.—Weed.

SILENE ANTIRRHINA L. Mount Rose, SS 6063.—Dry, exposed rocky slopes. Essentially non-glutinous (f. *Deaneana* Fern.); and petals "whitish" according to the collectors' label data suggesting f. *bicolor* Farw., although in the dried state they are purplish below.

S. ARMERIA L. Grand Marais, H. W. Slack (July 1892).—Probably an escape.

PORTULACACEAE

CLAYTONIA CAROLINIANA Michx. Hovland, BR 4628.—Moist woods.

NYMPHAEACEAE

NUPHAR MICROPHYLLUM (Pers.) Fernald, RHODORA 19: 111. Also *cf.* RHODORA 21: 186 & RHODORA 39: 407. Sawbill Lake, Bg 96; Daniels Lake, L. S. Cheney (July 14, 1891); Temperance River, C. B. Reif A20.—Depth of 2½ feet, muck and rock bottom, locally abundant.

Reported by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134) from Kadunce Creek.

N. \times RUBRODISCUM Morong. Round Lake, C. B. Reif A3; Birch Lake, BA 807; Brule River, BR 4525.—Locally abundant, water up to 4 ft. deep, sand bottom. Reported by Smith and Moyle (*loc. cit.*) from Kadunce Creek.

N. VARIEGATUM Engelm. Leo Lake, BAA 330a; Clearwater Lake, BBI 396; Grand Portage, BR 6289; Brule River, BR 4524, C. B. Reif A34.—Shallow water to a depth of 4 ft., bottom mud to sand. Reported by Smith and Moyle (*loc. cit.*) from Two Island River, Poplar River, Cascade River.

NYMPHAEA ODORATA Ait. Horseshoe Lake, L. W. Orr 29; John Lake, BsH 267.—Very common. Reported by Smith and Moyle (*loc. cit.*) as from Kadunce Creek, although they state (*op. cit.*, p. 138) that it has been collected "only from ponded waters of the Baptism River."

N. TETRAGONA Georgi. This rarest of Minnesota species may be expected in Cook Co. because of its occurrence in near-by Lake County and on Isle Royale. Professor N. L. Huff's (no. 205, Jul. 31, 1914, Bald Eagle Lake, Lake Co.) notable collection has long stood as the only one for Minnesota in the Herbarium of the University of Minnesota. Very recently (Aug. 20, 1949) W. J. Breckenridge & J. A. Jarosz have added another station for the state at Mulligan Lake in Lake of the Woods County.

BRASENIA SCHREBERI Gmel. Sight record only. Reported by John De Q. Briggs and Marjorie W. Briggs to be locally very abundant in western Cook County.

RANUNCULACEAE

RANUNCULUS TRICHOPHYLLUS Chaix, var. TRICHOPHYLLUS., cf. RHODORA 38: 18. Burnt Lake, J. De Q. & W. Briggs 125; Brule River, C. B. Reif (Aug. 1938); Mark Creek, C. B. Reif A24; Temperance River, C. B. Reif A2.—Mucky, sand or rock stream bottom; sometimes locally abundant. Reported by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134) from Temperance River, Cascade River, Devil Track River, Kimball Creek and Brule River. They refer their specimens from the Arrowhead and Temperance River to var. *eradicatus* (Laest.) Drew (*loc. cit.*, p. 138).

R. LAPONICUS L. Definitely reported from Cook County by L. S. Cheney (Trans. Wisc. Acad. Sci., Arts & Let. 9: 235) on the basis of his collections of 1891. He states that he collected this species "on the Duluth and Port Arthur trail, three miles west of Mawshequawcawmaw River." His spelling of the name seems to be a variant of the Chippewa name (cf. W. Upham, Minnesota Geographic Names, Coll. Minn. Hist. Soc. 17: 140. 1920.) for the Reservation River. This puts Cheney's Cook County station for this species three miles west of the western boundary of the Grand Portage Indian Reservation. This location coincides very closely with Coulter & Fisher's (Bot. Gaz. 18: 299) description of the locality as "twenty miles northeast of Grand Marais." There is no specimen representing this collection in the Herbarium of the University of Minnesota.

Less definite is the location of a collection made in 1870 by "Mr. Joseph C. Jones" who was "then of the U. S. Steamer *Search*" according to Asa Gray's account (Bot. Gaz. 11: 17) of a letter received from the collector. Gray reported the collection under the name *Anemone nudicaulis* Gray, although he states that he "mistook the plant" for *Anemone Richardsonii*. Mr. Jones apparently gave Gray to understand that this plant was collected at "Sand bay, Minnesota, very near lat. 48°, and in or near the Canadian boundary." If the collection was made on the shore of Lake Superior this would put the station near Grand Portage. But "Sand bay" is an elusive locality, no place of this name being given for Cook County by Upham (*loc. cit.*), nor in the volumes of the Final Report on the Geology of Minnesota. It is perhaps significant that Coulter and Fisher (Bot. Gaz. 18: 299) state that "Mr. Cheney's specimens were collected in the same region as the imperfectly known *Anemone nudicaulis* Gray, which Dr. N. L. Britton has shown to be *Ranunculus Lapponicus*."

This species is not yet represented in the Herbarium of the University of Minnesota from Cook County, but is known in the state from near-by St. Louis County (Lakela 8448), from Aitkin County (N. L. Huff, June 9, 1928) and from Itasca County (N. L. Huff, July 20, 1929 and Butters and Rosendahl 6851).

R. REPTANS L. *cf.* RHODORA 19: 135. *R. Flammula* L., var. *reptans* Mey. Saganaga Lake, N 1681; Pigeon River, L. S. Cheney (Jul. 8, 1891); Smoke Lake, J. De Q. Briggs (sight record, Aug. 12, 1948).—Wet clay soil; general in the eastern and northern part of the state.

R. ABORTIVUS L., var. *ACROLASIUS* Fernald, RHODORA 40: 418. Mountain Lake, BAA 324; South Fowl Lake, BABs 634; Mineral Center, BR 4599.—Moist woods and portage trails.

R. abortivus var. *acrolasius* tends to occur primarily in the northern part of the state and gives way to *R. abortivus*, var. *typicus* Fernald in the central and southern portion of the state.

R. PENNSYLVANICUS L. f. Sawbill Lake, Bg 93; Partridge Lake, BA 785; Hungry Jack Lake, BAA 332; Mountain Lake, BAA 291; West Pike Lake, BsH 171; South Fowl Lake, BsH 292; Susie Island, R 6045, OO 1129; Grand Portage, Be 672; Grand Marais, T. S. Roberts (Jul. 27, 1879); Temperance River, C. B. Reif A 11.—Moist areas, sometimes submerged; abundant.

R. MACOUNII Britton. South Fowl Lake, BABs 633.—Marshy open area; rare. This is the second record from the state, the first being J. W. & M. F. Moore 11071 collected the previous year in an open meadow in Lake of the Woods County July 24, 1939.

R. ACRIS L. Mountain Lake, BAA 323; Brule River, E. Loula 21; Grand Portage, L. S. Cheney (Jul. 6, 1891), Be 582, S. Brown 2, BAA 459; Grand Marais, H. L. Lyon 918; Sawbill Trail, Bg 92, Bg 95.—Portage trails, roadsides, meadows; very common north of Lake Superior, rather uncommon elsewhere in the state.

THALICTRUM DASYCARPUM Fisch. & Lall. Seagull Lake, BA 916; Poplar Lake, D 83; Birch Lake, BA 776; Clearwater Lake, BsH 168;

Mountain Lake, BBsH 21; Royal River, BsH 288a, BsH 288b; Lucille Island, OO 1090; Grand Portage, Be 504, Be 506, Butters & Wherry (June 30, 1935); Mineral Center, BR 4570.—Portage trails, moist slopes, stream banks; common.

ANEMONE VIRGINIANA L. Grand Portage, BM 10868, BA 990; Mount Josephine, BA 1053.—Old trails.

A. CANADENSIS L. Grand Portage, Be (Aug. 22, 1929), S. Brown 3; Mineral Center, BR 4571.—Paths, roadsides, stream banks.

A. QUINQUEFOLIA L., var. *INTERIOR* Fernald, *RHODORA* **37**: 260. Tucker Lake, D 181; Mountain Lake, BAA 289, BAA 305; Pigeon River, BR 4612; Grand Marais, L. S. Cheney (June 26, 1891).—Portage trails, moist woods.

CLEMATIS VIRGINIANA L., f. *MISSOURIENSIS* (Rydb.) Fernald, *RHODORA* **39**: 309. Cross River, BBI 389, BA 894 (♀), BA 895 (♂); Susie Island, R 6042, OO 1034.—Thickets; very local, but abundant where it occurs. The Cook County material all seems to fall in this form with the characteristic silky pubescence, but the bulk of the material from the state is more or less strigulose pubescent; a very little is nearly or quite glabrate.

C. VERTICILLARIS DC. North Lake, D. Lange 13; Leo Lake, D 148; Watab Lake, BBI 432; Clearwater Lake, BA 100; North Fowl Lake, BABs 660; Mount Josephine, N 1610, BA 1047; Black Point, T. S. Roberts (Aug. 24, 1879).—Thickets; general but not common.

CALTHA PALUSTRIS L. Poplar Lake, D 23; Grand Portage, Be 540; Temperance River, C. B. Reif A7.—Wet, marshy areas, stream banks; common throughout the county. Reported by Smith and Moyle (Minn. Dept. Cons., Tech. Bull. 1, p. 134) from the Temperance, Onion and Cascade Rivers.

C. NATANS Pall. This has long been known from Lake Vermillion and Tower and has recently been collected by Miss Lakela (no. 5110) in near-by St. Louis County. It is to be expected in Cook County.

COPTIS GROENLANDICA (Oeder) Fernald, *RHODORA* **31**: 142. Sea Gull Lake, L 3653; Poplar Lake, D 33; Watab Lake, BA 118a, BBsH 117; Pigeon River, BR 4553; Devil's Track River, T. S. Roberts (Aug. 15, 1879).—Sphagnum bogs and wet spruce woods; common.

AQUILEGIA CANADENSIS L. Sawbill Lake, Bg 94; Watab Lake, BAA 231; Clearwater Lake, Butters & Wherry (June 28, 1935), BA 73, D 121; Brule River, E. Loula 1; Mountain Lake, BAA 248, BAA 298; Grand Portage, S. Brown 1; Carribeau River, BR 4497.—Cliffs, moist slopes and shady ledges. The flowers of the plants growing on the shaded cliffs are not infrequently of a yellowish cast and tend to be rather broad for their length which gives them a "stubby" appearance.

ACTAEA RUBRA (Ait.) Willd. Sea Gull Lake, L 3675; Mountain Lake, BAA 304, BBsH 31; South Fowl Lake, BABs 627; Poplar Lake, D 50a; Grand Portage, Be 516, Be 684, BR 6215, S. Brown (1935); Mineral Center, BR 4585; Kimball Creek, R 2617; Carribeau River, BR 4483, BR 4484.—Rich woods.

A. RUBRA f. *NEGLECTA* (Gillman) Robinson. cf. Fernald, *RHODORA* **42**: 261. Grand Portage, BR 6214, R 7902; Lutsen, L 4840; Thunder Bay Dist., Ont. (Pigeon Bay), AA 600.—Rich woods.

PAPAVERACEAE

CORYDALIS SEMPERVIRENS (L.) Persoon. Sea Gull Lake, L 3629; Moss Lake, D 138, O 954; Winchell Lake, BA 140; Alder Lake, BsH 385; Lima Mountain, BA 873; Mountain Lake, BBsH 69; West Pike Lake, BBsH 178; East Pike Lake, BsH 213; MacFarland Lake, BBl 339, BsH 368; North Fowl Lake, BABs 656; South Fowl Lake, BM 10821; Morrison Bay, BBs 726; Belle Rose Island, OO 1058; Susie Island, BBl 349; Lucille Island, BAA 364; Sailboat Island, AA 533; Grand Portage, S. Brown 25; Mount Josephine, BA 168; Hovland, Be 611; Kimball Creek, R 2625; Grand Marais, F. F. Woods (June 23, 1891), BR 4660; Carlton Peak, T. S. Roberts (Aug. 25, 1879).—Cliffs, rocky shores, talus slopes, and generally in dry, sterile situations; common. There is a great deal of variation in the foliage of this species, but the floral structure is fairly constant.

C. AUREA Willd., ssp. *AUREA*. *cf.* G. B. Ownbey, Ann. Mo. Bot. Gard. 34: 229. Watab Lake, BAA 228; Clearwater Lake, BBl 419, BsH 160; Mountain Lake, BBsH 124, BBsH 131; West Pike Lake, BsH 199; East Pike Lake, BsH 218; South Fowl Lake, BABs 631, BM 10832; Royal River, BsH 344; Grand Portage, S. Brown 28, BA 147, BAA 458, SS 12030; Mount Josephine, BA 163; Temperance River, SS A5419.—Cliffs, talus slopes, hilltops, poplar woods; common.

The flowers of BsH 160 and BM 10832 have the outer petals with crests 0.5–0.75 mm. high, crenate or 3- to 4-toothed. Otherwise (size of flowers, shape and size of spur, fruit, seeds, leaves, bracts, etc.) they are like typical *C. aurea*. This is a variant which Dr. G. B. Ownbey assures us is apparently not uncommon (*cf.* Ownbey, *op. cit.*, p. 231).

CRUCIFERAE

DRABA NORVEGICA Gunner *cf.* Fernald, RHODORA 36: 321. Susie Island, AA 562.—Unique occurrence in the gravel of a disintegrating dike. On the basis of the stations listed by Fernald (*loc. cit.*, and Gray's Man., ed. 8, p. 696) this is the first record for the species, not only in Minnesota, but also in the Great Lakes basin, the closest reported station being in the southeast corner of James Bay. It is another example of the series of species which appear to be isolated in the region.

D. ARABISANS Michx. (typical) *cf.* Fernald, RHODORA 36: 353. Clearwater Lake, Butters and Wherry (June 29, 1935), BA 86; South Fowl Lake, BsH 280, BABs 614; Thunder Bay Dist., Ont. (North Fowl Lake) BABs 678, BABs 689.—Inland cliffs, often locally abundant. Otherwise known in the state only from Lake County, except for a Juni collection indicated simply as from the north shore of Lake Superior.

We include var. *canadensis* (Brunet) Fern. & Knowlt. in typical *D. arabisans* in spite of Fernald's continued recognition of this variety in Gray's Manual, ed. 8, p. 697. Fernald (*op. cit.*, p. 357) had earlier remarked that it is "presumably, not a very significant extreme." His feeling is fully justified by W. S. Cooper's no. 312 from Isle Royale (in Herb. Minn.) in which some of the siliques are short and relatively broad while other siliques on the same plant are twisted and flattened. It is

highly questionable in the face of this whether var. *canadensis* may be considered a stable taxonomic entity.

D. arabisans sens. lat. is represented from Cook County, and the Thunder Bay District of Ontario by eleven collections in the Herbarium of the University of Minnesota. Six of these agree perfectly with Professor Fernald's description (RHODORA 36: 353) of the typical material. There is one minor exception to this statement, namely, that an occasional stellate hair may occur on the valves of a silique here and there. This condition, as indicated by an examination of other sheets in the Herbarium of the University of Minnesota, also exists in eastern material, such as, Collins and Fernald no. 92 (Bic, Rimouski County, Quebec), and Wag-horne no. 22 (Bay of Islands, Newfoundland). The type specimen would seem to have a few stellate hairs on the valves, as indicated by Mrs. Ekman's discussion of it as quoted by Fernald (*op. cit.*, p. 251); Mrs. Ekman says of the type that "To the naked eye the fruits of *D. arabisans* looked glabrous, but under the microscope a few hairs were found in the margin of the valves of some of them."

Our remaining five collections, come from the slate cliffs and talus of Grand Portage, Minn. and nearby Pigeon Bay (Ont.). In these the siliques are markedly stellate pubescent, even when post-mature. This characteristic is not, however, always easily noted in specimens which have lain for any length of time in the herbarium—the protected siliques which have not been rubbed must sometimes be looked for. A striking fact is that collections made four different years in the vicinity of Grand Portage show that this characteristic has re-appeared consistently year after year. This very distinct variety bears the same relation to the typical material that *D. nemorosa* L., var. *lejocarpa* Lindbl. bears to *D. nemorosa* (typical), and *D. cuneifolia* Nutt., var. *leiocarpa* O. E. Schulz bears to *D. cuneifolia* Nutt.; it represents a trend which Fernald (*op. cit.*, p. 369) states is not uncommon when he compares *D. reptans* (Lam.) Fernald with *D. reptans*, var. *micrantha* (Nutt.) Fernald. This new variety of *D. arabisans* we propose as:—

D. ARABISANS Michx., var. ***superiorensis*** var. nov. A typo differt: siliculis stellato-pubescentis. TYPE: F. K. Butters, E. C. Abbe & L. B. Abbe 461, July 14, 1937, on the fern cliffs near Grand Portage (in Herb. Minn.). Other specimens seen: Minnesota—Rosendahl 6065, Aug. 14, 1929, ledges of rock, w. side of Grand Portage village; Butters and Buell 367, July 8, 1932, talus slope below calcareous cliff, Grand Portage; Butters and Abbe 158, June 28, 1936, talus below slate cliffs, Grand Portage; Thunder Bay District, Ontario—Abbe and Abbe 598, Aug. 21, 1937, dry slate cliffs on the north side of Pigeon Bay.

D. NEMOROSA L., var. *LEJOCARPA* Lindbl. cf. Fernald, RHODORA 36: 366. Watab Lake, BA 113; Clearwater Lake, BA 124; Mountain Lake, BAA 250, BBsH 45; Pike Lake, BBsH 141; South Fowl Lake, BsH 318, BM 10833; Grand Portage, BA 157, BAA 461a; Mount Rose, SS 6067a.—Cliffs and talus slopes.

THLASPI ARVENSE L. Grand Marais, M. E. Oldenburg (Nov. 1944); Cascade River, BA 760.—Introduced weed.

LEPIDIUM DENSIFLORUM Schrad. Brule River, BR 4528, BR 4529; Poplar Lake, BA 844.—Introduced weed.

SUBULARIA AQUATICA L. Poplar Lake, BA 962.—Shallow water; very rare. First and only record of this species for the state in the Herbarium of the University of Minnesota.

CAPSELLA BURSA-PASTORIS (L.) Medic. Grand Portage, Be 671.—Roadside.

SINAPIS ARVENSIS L. *Brassica arvensis* (L.) Rabenh. *Brassica Kaber* (DC.) L. C. Wheeler, var. *pinnatifida* (Stokes) L. C. Wheeler, RHODORA 40: 306. Sawbill Lake, Bg 91; Grand Portage, Be 685.—Lake shore, road; weed. The pod characters given by Schulz (Pflzr., 105: 119) seem to justify maintaining this as a genus apart from *Brassica*.

ERUCASTRUM GALLICUM (Willd.) O. E. Schulz. Grand Marais, M. E. Oldenburg (Nov. 1944).

DESCURAINIA PINNATA (Walt.) Britt., var. BRACHYCARPA (Richards.) Fernald, RHODORA 42: 266. *D. brachycarpa* (Richardson) O. E. Schulz, Pflzrch. 105: 325. Grand Marais, L. S. Cheney (June 19, 1891).

RORIPPA ISLANDICA (Oeder ex Murray) Borbás, var. FERNALDIANA Butters and Abbe, RHODORA 42: 285. *R. islandica*, var. *microcarpa* (Regel) Fernald, RHODORA 42: 271; cf. Fernald, RHODORA 50: 100. Sawbill Lake, Bg 90; John Lake, BM 10860; Lima Mountain, BA 853; Cascade River, BR 6914.—Rocky and sandy shores, roadsides; occasional.

R. islandica, var. *HISPIDA* (Desv.). Butters and Abbe, RHODORA 42: 26. Sea Gull Lake, N 1674.—Sandy lake shores.

BARBAREA VULGARIS R. Br. Lucille Island, OO 1095; Grand Portage, BA 1023.—Roadside.

CARDAMINE PARVIFLORA L., var. ARENICOLA (Britton) O. E. Schulz. cf. Fernald, RHODORA 29: 191. Sea Gull Lake, L 3689; Watab Lake, BA 105a, BAA 242; Clearwater Lake, BBl 408, Butters and Wherry (June 29, 1935), BA 74, BA 121, D 125c; Mountain Lake, BAA 260 & 297; West Pike Lake, BsH 177; East Pike Lake, BsH 216; North Fowl Lake, BABs 703; South Fowl Lake, BsH 283, BABs 623; Royal River, BsH 363; Mount Josephine, BA 166.—Ant-hills, cliffs, dry ridges and hilltops; often locally abundant. BA 74 is merely a depauperate form (f. *gracillima* O. E. Schulz, Engl. Bot. Jahrb., 32: 485) but all 40 or so individuals of the collection are uniformly similar.

C. PENSYLVANICA Muhl. Gunflint Lake, BBl 375; South Lake, BA 783; Moss Lake, D 128; Hungry Jack Lake, BAA 328; Mount Josephine, BA 179; Mineral Center, BR 4598.—Moist places in trails, etc.; occasional. BA 179 grades from the usual state into var. *gracilis* O. E. Schulz, Engl. Bot. Jahrb. 32: 481.

(To be continued)

THE GENUS *LYONIA* IN MISSOURI.—The occurrence of *Lyonia mariana* (L.) D. Don in Missouri was first observed this summer (1952) when several specimens were received for identification. As far as is known, this constitutes a new genus record for the State.^{1 2} Trips have since been taken to the location from which the specimens were collected, in order to establish more definitely the extent of *Lyonia* in this area.

Scattered colonies of *L. mariana* were found in two separate areas about a mile apart on Rubideaux Sandstone in Dent County, T35N, R7W; sections 15 and 16. These colonies varying from several stems to many hundreds occupied the low, sandy ground of two small drainages in rolling, wooded topography. One colony was observed on a more elevated site. In the larger of the two areas, colonies were scattered at intervals along the drainage for nearly a mile.

One landowner on whose property *Lyonia* is present stated that it has occurred here as long as he can remember, and periodically caused livestock poisoning. Previous owners, members of the same family, also had noted its presence in years past.

The presence of *Lyonia mariana* heretofore not known to occur in Missouri extends its range as given in the 8th edition of the Gray's Manual.³ The Manual indicates that west Tennessee and Arkansas are the nearest limits to its presently known location in Missouri. This isolation in approximate south-central Missouri from these states to the south and east may indicate other locations when additional surveys are made.

In addition to deposits in the herbarium of the University of Missouri, specimens of *Lyonia* have been sent to the Missouri Botanical Garden, St. Louis, and the Chicago Natural History Museum.

Appreciation is expressed for the loan of herbarium material made by Dr. A. J. Sharp, University of Tennessee.—C. L. KUCERA, BOTANY DEPARTMENT, UNIVERSITY OF MISSOURI, COLUMBIA, MISSOURI.

¹ Palmer, E. J. and J. A. Steyermark. An Annotated Catalogue of the Flowering Plants of Missouri. Ann. Mo. Bot. Gard. 22: 375-758. 1935.

² J. A. Steyermark, personal communication, Curator of Herbarium, Chicago Nat. Hist. Museum.

³ Fernald, M. L. Gray's Manual of Botany, 8th ed. 1950.

ELYMUS RIPARIUS IN ILLINOIS.—*Elymus riparius* Wiegand is a very distinctive species, which, like *E. canadensis* L., has usually nodding heads, but differs from that species in the straight awns of the lemmas and in the smaller paleas. In the second edition of Hitchcock's Manual of the Grasses of the United States (1950), its distribution is represented by dots as occurring in all the states surrounding Illinois. But for Illinois there is nothing but a blank indicated on the distribution map (p. 261). Nor is the species mentioned in either the first or second editions of Jones's Flora of Illinois.

It was, therefore, somewhat of a surprise to discover this species growing wild in the natural wooded ravines of the hilly Valparaiso Moraine section of northeastern Illinois where the author resides. These ravines have a rich mesophytic flora, and support such species as *Trillium flexipes*, *T. erectum*, *Smilax ecirrhata*, *Hepatica acutiloba* and *H. americana*, *Actaea pachypoda*, *A. rubra*, *Thalictrum dioicum*, *Sanguinaria canadensis*, *Dentaria laciniata*, *Dicentra Cucullaria*, *Caulophyllum thalictroides*, *Staphylea trifolia*, *Panax quinquefolius*, *Hydrophyllum virginianum*, *Lithospermum latifolium*, *Aster Shortii*, and a long list of other interesting species. Some of the indigenous species in the area, such as *Botrychium dissectum* (typical), *Liparis lilifolia*, *Convolvulus spithameus*, and others, constituted new county records for Illinois when originally discovered.

The finding of the first Illinois record of *Elymus riparius* is not too surprising, therefore, in view of the many rare or uncommon species already collected by the author in the same general vicinity. The specimen has been deposited in the Chicago Natural History Museum Herbarium. The data for it is, wooded ravine slopes near creek just east of Kimberley road, Biltmore Estates subdivision, 6 mi. northeast of Barrington, Lake Co., Illinois, August 14, 1948, *Steyermark 65952*, "heads nodding; leaves up to 2.2 cm. wide."—JULIAN A. STEYERMARK, CHICAGO NATURAL HISTORY MUSEUM AND MISSOURI BOTANICAL GARDEN.

Volume 55, no. 651, including pages 61-108 was issued March 26, 1953

RATES FOR SPECIAL NUMBERS OF RHODORA

Many of the single numbers can be supplied only at special prices, as follows:

Vol. 12, no. 134: 50c no. 138: 45c	Vol. 37, no. 436: 70c no. 437: 50c no. 470: 60c no. 440: 60c no. 441: 50c no. 443: 55c no. 444: 55c	Vol. 46, no. 547: 50c no. 548: 45c no. 550: 55c no. 551: 55c no. 552: 50c
Vol. 13, no. 151: 70c		Vol. 47, no. 553: 75c no. 554: 50c no. 555: 60c no. 556: 75c no. 557: 75c no. 558: 50c no. 559: 75c no. 560: 60c no. 562: 85c no. 563: 85c
Vol. 14, no. 163: 60c	Vol. 38, no. 445: 50c no. 448: 70c no. 450: 70c no. 455: 55c no. 456: 50c	Vol. 48, no. 566: 60c no. 567: 50c no. 568: 60c no. 569: 50c no. 570: 50c no. 571: 60c no. 572: 50c no. 573: 70c no. 574: 70c no. 575: 70c no. 576: 50c
Vol. 15, no. 171: 45c	Vol. 39, no. 458: 50c no. 463: 55c no. 464: 75c no. 466: 55c	Vol. 49, no. 577: 50c no. 578: 60c no. 580: 60c no. 581: 70c no. 582: 80c no. 583: 75c no. 587: 50c no. 588: 50c
Vol. 16, no. 182: 45c	Vol. 40, no. 471: \$1 no. 476: 50c no. 477: 55c no. 478: 60c no. 479: 55c	Vol. 50, no. 589: 45c no. 590: 60c no. 591: 40c no. 592: 60c no. 593: 60c no. 594: 40c no. 595: 75c no. 596: 85c no. 597: 55c no. 598: 40c no. 599: 60c no. 600: 65c
Vol. 17, no. 193: 45c	Vol. 41, no. 482: 55c no. 486: 55c no. 487: \$1 no. 488: 60c no. 489: 95c no. 490: 50c no. 491: 50c	Vol. 51, no. 603: 80c no. 604: 85c no. 609: 75c no. 610: 70c no. 611: 70c no. 612: 70c no. 616: 50c no. 617: 70c no. 618: 60c no. 623: 50c no. 624: 60c
Vol. 18, no. 205: 50c	Vol. 42, no. 499: 50c no. 500: \$1 no. 502: 50c no. 503: 70c	
Vol. 19, no. 224: 45c no. 225: 50c	Vol. 43, no. 506: \$1 no. 509: \$1 no. 512: 50c no. 513: 50c no. 514: 70c no. 515: 75c	
Vol. 21, no. 241: 45c no. 243: 45c	Vol. 44, no. 520: 70c no. 525: 75c no. 526: 75c no. 527: 70c no. 528: 60c	
Vol. 23, no. 265: 45c no. 268: 45c no. 269: 45c no. 270: 45c no. 271: 45c no. 274: 45c no. 275: 45c	Vol. 45, no. 529: \$1 no. 531: 60c no. 532: 55c no. 533: 55c no. 534: 75c no. 535: 70c no. 538: 85c no. 539: 75c no. 540: 75c	
Vol. 24, no. 279: 45c no. 283: 45c	Vol. 46, no. 542: 50c no. 544: 60c no. 545: 55c no. 546: 55c	
Vol. 25, no. 296: 45c		
Vol. 26, no. 304: 50c no. 305: 60c no. 306: 45c		
Vol. 28, no. 331: 45c		
Vol. 29, no. 346: 45c		
Vol. 30, no. 351: 50c no. 356: 45c no. 357: 45c		
Vol. 31, no. 364: 50c no. 369: 50c no. 370: 50c		
Vol. 32, no. 374: \$1 no. 376: 45c no. 382: 50c no. 383: 45c		
Vol. 33, no. 386: 60c no. 388: 45c no. 389: 45c no. 391: \$1		
Vol. 34, no. 403: 45c no. 407: 45c		
Vol. 35, no. 410: 50c no. 418: 50c no. 419: 50c		
Vol. 36, no. 425: 55c no. 426: 50c no. 429: 70c no. 430: 55c		
Vol. 37, no. 433: \$1 no. 435: 60c		

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY

68. ROBINSON, B. L. I. Records preliminary to a general Treatment of the Eupatorieae,—III. Johnston, I. M. II. Studies in the Boraginaceae. 1. Restoration of the Genus *Hackelia*. 2. The Genus *Antiphytum*. 3. Novelties and new Combinations in the Genus *Cryptantha*. 4. A Synopsis and Redefinition of *Plagiobothrys*. III. Diagnoses and Notes relating to the Spermatophytes chiefly of North America. (Published by the Gray Herbarium. 1-104 pp. 1923.) .65
69. BRACKETT, A. I. Revision of the American Species of *Hypoxis*. With 13 figs. II. Some Genera closely related to *Hypoxis*. With 4 figs. (Reprinted from *Rhodora*, XXV. 41 pp. 1923.) .50
70. JOHNSTON, I. M. I. Studies in the Boraginaceae,—II. 1. A Synopsis of the American native and immigrant Borages of the Subfamily Boraginoideae. 2. A tentative Classification of the South American *Coldenias*. II. Taxonomic Records concerning American Spermatophytes. 1. *Parkinsonia* and *Cercidium*. 2. New or otherwise noteworthy Plants. 3. A neglected Paper by Jean Louis Berlandier. 4. On the Validity of Molina's scientific Names. (Published by the Gray Herbarium. 1-92 pp. 1924.) .65
71. PENLAND, C. WILLIAM. Notes on North American *Scutellarias*. With 2 plates. (Reprinted from *Rhodora*, XXVI. 61-79 pp. 1924.) .35
72. FERNALD, M. L. I. *Polystichum mohrioides* and some other subantarctic or Andean Plants in the Northern Hemisphere. II. The dwarf *Antennarias* of northeastern America. III. The eastern American Representatives of *Arnica alpina*. IV. Some *Senecios* of eastern Quebec and Newfoundland. V. New or restudied Plants of eastern America. With 3 plates. (Reprinted from *Rhodora*, XXVI. 33 pp. 1924.) .40
73. ROBINSON, B. L. I. Records preliminary to a general Treatment of the Eupatorieae,—IV. Johnston, I. M. II. New Plants collected by Mrs. Richard C. Curtis in Portuguese West Africa. With 2 plates. Johnston, I. M. III. On some South American *Proteaceae*. Johnston, I. M. IV. Studies in Boraginaceae,—III. 1. The Old World Genera of the Boraginoideae. 2. Notes on miscellaneous American Boraginaceae. (Published by the Gray Herbarium. 1-78 pp. 1924.) .65
- *74. JOHNSTON, I. M. I. Studies in the Boraginaceae.—IV. II. The North American species of *Cryptantha*. (Published by the Gray Herbarium. 1-114 pp. 1925.) .80
- *75. ROBINSON, B. L. I. Records preliminary to a general Treatment of the Eupatorieae,—V. Munz, P. A. & Johnston, I. M. II. The *Oenotheras* of northwestern South America. Johnston, I. M. III. Further New Plants collected by Mrs. Richard C. Curtis in Tropical Africa. IV. Some undescribed American Spermatophytes. V. Studies in the Boraginaceae,—V. (Published by the Gray Herbarium. 1-49 pp. 1925.) .50
- *76. FERNALD, M. L. Two Summers of Botanizing in Newfoundland. With 3 plates. (Reprinted from *Rhodora*, XXVIII. 144 pp. 1927.) 1.00
77. ROBINSON, B. L. Records Preliminary to a General Treatment of the Eupatorieae,—VI. (Published by the Gray Herbarium. 1-62 pp. 1926.) .50
78. JOHNSTON, I. M. Studies in the Boraginaceae.—VI. A Revision of the South American Boraginoideae. (Published by the Gray Herbarium. 1-118 pp. 1927.) .80

*Out of print.